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Research Report 1287

DEVELOPMENT AND EVALUATION OF THE TACTICAL PREMISSION PLANNING TRAINING MODULE

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U. S. Army
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The purpose of this research was to develop a training module for tactical premission planning and to evaluate this module in a field setting. As a result of developmental activities the module contained three components which enabled an aviator to identify tasks to be considered in premission planning, to determine how to accomplish each task, and to assess premission planning performance. The evaluation of the module was conducted in two air cavalry units. Half the aviators in each unit were given the opportunity to use the module.

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Data collected prior to the introduction of the module indicated that the aviators performed little premission planning, yet expressed a need for a premission planning training module. The results of a questionnaire administered after a 90-day trial period indicated that those aviators who were given the opportunity to use the training module judged the module to be acceptable and useful in its present form for both training and self-assessment. The implications of this research are discussed, along with recommendations for future research.

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DEVELOPMENT AND EVALUATION OF THE TACTICAL PREMISSION PLANNING TRAINING MODULE

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Aircrew Performance

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FOREWORD

This Research Report covers the development and evaluation of the tactical premission planning training module which was made possible through the research efforts of Ronald Cox and John Ruffner from the Canyon Research Group, Inc.

This report, under contract DAHC 19-77-C-0059, found early in its research that the two operational helicopter squadrons it was studying did little premission planning. The results of this research have been implemented into those two squadrons and the Tactical Premission Planning Training Module is now an acceptable self-contained instructional aide.

Many people contributed towards this research effort who should be recognized at this point, including Charles Gainer, Chief, ARI Field Unit at Fort Rucker, Alabama, who served as the Contracting Officer's Technical Representative. Dr. Martin Allnutt was the Technical Team Leader and ARI Exchange Scientist from the Army Personnel Research Establishment, Farnsborough, Hants, England who provided guidance and offered many valuable suggestions throughout this research.

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Dr. Ethlyn Garlichs and Roik Hockenberger, formerly of Canyon Research Group, Inc., contributed to the research design and data collection efforts during the early stages of this research. The commanders and aviators from the FORSCOM units and from the United States Army Aviation Center are thanked for supporting and participating in this research.

Finally, a special note of appreciation to Mrs. Ernestine Pridgen, office manager of Canyon Research Group, Inc., who provided valuable editorial advice and assistance in the preparation of this report.

JOSEPH ZEIDNER
Technical Director

DEVELOPMENT AND EVALUATION OF THE TACTICAL PREMISSION PLANNING TRAINING MODULE

BRIEF

Requirement:

This research was performed to develop and evaluate a training module for tactical premission planning. The module met a previously identified requirement for training to reduce deficiencies in terrain flight by improving the premission planning function which is a prerequisite for successful tactical terrain flight.

Procedure:

Development of this training module was guided by Instructional System Development (ISD) procedures and met three training objectives: (1) identify the tasks to be considered during premission planning; (2) determine the manner in which each task should be accomplished; and (3) assess the effectiveness of premission planning and identify performance discrepancies. The training module consisted of three components, each designed to meet one of the three training objectives. These components were: (1) the Premission Planning Checklist; (2) the Training Guide for Tactical Premission Planning; and (3) the Premission Planning Check Sheet.

The Tactical Premission Planning Training Module was evaluated in two air cavalry aviation units. At the beginning of the evaluation period both premission planning behavior data and subjective data were gathered from aviators in these units. The subjective data indicated the subjects' opinions about present premission planning in their units, the subjects' perceived need for a training module for several candidate training topics, and the perceived ability of aviators to assess their own premission planning performance, given well defined standards.

During a 90-day period of module usage, half the subjects were given the opportunity to use the training module in planning tactical missions. Following this period, evaluation data were collected indicating the subjects' opinions about the usefulness and acceptability of the training module.

Findings:

The data collected prior to the period of module usage indicated that aviators in two operational units were conducting little premission planning. The planning that was being done was rated as unorganized, not very effective, and possibly contributing to mission failure. Additionally, a need was expressed for a training module on the topic of premission planning as well as for other topics related to air cavalry-type missions. These findings validated the analysis of training requirements performed during the preliminary stage of this research.

Data collected following the period of module usage indicated that those aviators who were given the opportunity to use the module judged it to be acceptable in its present form. All three components were judged to be useful and complete for the subjects' premission planning needs. Additionally, the subjects indicated that the Premission Planning Check Sheet was a useful tool for self-assessment and that self-assessment could

improve their premission planning performance. Subjects also expressed a need for early exposure to premission planning and introduction to a training module for premission planning in flight school.

Utilization of Findings:

The results of this research indicated that the Tactical Premission Planning Training Module in its present form is an acceptable self-contained instructional package. This training module has applications for training and assessment of premission planning for both the unit training and the institutional training settings.

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INTRODUCTION

The Problem

The US Army Research Institute for the Behavioral and Social Sciences (ARI) has identified a requirement for the development of unit training and evaluation techniques for combat-ready helicopter pilots. During the past two years, Canyon Research Group, Inc. has been conducting research under contract with ARI to analyze training requirements and to develop a series of training modules to meet these requirements. This paper describes the development and evaluation of a training module (i.e., a self-contained instructional unit) for tactical premission planning.

Background

During the first year of Canyon's research the missions of Army combat units were examined to determine where performance deficiencies existed and/or recurred frequently.[1] Terrain flight was identified as a mission segment for which performance deficiencies existed. Subject matter experts (SMEs) at the US Army Aviation Center (USAAVNC) and two Forces Command (FORSCOM) units were then consulted to determine the real causes of the existing deficiencies in terrain flight. This analysis indicated that performance deficiencies in premission planning were thought to constitute the single most important cause of failures in missions including terrain flight. For example, an aviator may have planned a Nap-of-the-Earth (NOE) route which was ideal in terms of the terrain between the point of departure and destination. However, more thorough planning which considered the latest intelligence information about enemy air defense positions may have indicated that another route should have been taken to avoid enemy air defenses. Thus in the absence of systematic, detailed premission planning, an NOE flight could end in mission failure.

Although not specifically a part of terrain flight, premission planning can be regarded as a function which supports terrain flight. As used in this paper, the premission planning function is defined as the group of tasks which should be performed from the time the aviator receives the mission order up to and including the time of aircraft runup.

In addition to performance deficiencies in premission planning constituting the single most important cause of failures in missions involving terrain flight, premission planning was identified as a function which was common to all missions and was critical to their successful accomplishment. Therefore, a training requirement for premission planning was identified in the first year of research.

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[1] Long, George E., Ciley, Colin D., Jr., Hockenberger, Roik L., and Garlichs, Ethlyn A. *Development of an Instruction Program for Individual and Unit Training With Combat-Ready Pilots, Task 1.* Canyon Research Group, Inc., Westlake Village, CA, December 1978.

An analysis of existing training indicated that the subject of premission planning had received little attention in the training and scientific literature. It was given little or no coverage in Aircrew Training Manuals (ATMs) and lesson plans, and was found to be taught and evaluated in an informal, unsystematic manner both in flight school and in field units.

In some instances, instructor pilots (IPs) were found to teach the premission planning process informally by the "show, tell, do and inspect" method. In other instances, the premission planning process was taught more formally through the use of a locally prepared job performance aid, such as a checklist.

A thorough examination of existing instructional materials and job performance aids used to train and evaluate premission planning revealed that they were limited in scope and applicability. The premission planning instructional materials and job performance aids examined in the first year's research lacked sufficient consideration of the purpose and details of the premission planning process.[2]

On the basis of this examination it was determined that the training requirement for premission planning should be met by the development of a training module containing both job performance aids and instructional materials. Developmental efforts were guided by Instructional Systems Development (ISD) procedures.[3] In order to guide the development of a training module for premission planning, the researchers developed three training objectives: (1) identify the tasks to be considered during premission planning (what to do); (2) determine the manner in which each task should be accomplished (how to do it); and (3) assess the effectiveness of premission planning and identify performance discrepancies (how well was it done).

In summary, preliminary research by Canyon indicated that a training requirement existed for tactical premission planning and that this requirement should be met through the development of a training module containing both instructional materials and suitable job performance aids. In addition, a need existed for the evaluation of this module. This paper reports the development and evaluation of a training module for tactical premission planning.

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[2]Long, George E., et al., *op. cit.*, Ref. 1.

[3]TRADOC Pamphlet 350-30. Interservice Procedures for Instructional Systems Development: Executive Summary and Model. August 1975.

METHOD

Development of the Module

The Tactical Premission Planning Training Module (also referred to in this report as the "Module") was designed to provide the Army aviator in the field with the information needed to learn required knowledge and skills involved in premission planning. The Module offers the aviator the means to practice premission planning without necessarily flying the planned mission. It was intended to include all materials necessary to conduct premission planning, given that a mission and associated materials (e.g., maps and overlays) are available. It was designed to provide instruction without an instructor.[4]

The complete Module was planned as a looseleaf book consisting of three major components: (1) the Premission Planning Checklist; (2) the Training Guide for Tactical Premission Planning; and (3) the Premission Planning Check Sheet. Narrative guidelines which describe the purpose and effective use of these three components were included in the beginning of the Module.

Development of the Checklist. Based on the first training objective, namely, identifying the tasks to be considered during premission planning, it appeared that a task-by-task checklist should be the primary component of a module to train tactical premission planning. In order to determine the contents of this checklist, an analysis of terrain flight was performed during the first year's research. This analysis produced a terrain flight task list consisting of two parts: a premission phase and an execution phase. The premission phase contained those tasks involved in planning for terrain flight. The execution phase contained those tasks involved in carrying out terrain flight.

The terrain flight task list was then submitted for review by personnel both at USAAVNC and in operational units in the field. On the basis of this review, a preliminary version of the Premission Planning Checklist was developed from the premission phase of the terrain flight task list. As was noted previously, the premission planning function was judged to be critical to mission accomplishment; therefore, module development efforts focused on the premission phase rather than on the execution phase.

The preliminary version of the Premission Planning Checklist was developed to its final form as a result of additional review by SMEs in FORSCOM operational units and by SMEs who teach the Combat Skills phase of Aeroscout training in the Initial Entry Rotary Wing (IERW) course at USAAVNC. The final form of the Premission Planning Checklist is given in Appendix A of this report. In order to determine if potential users of the Checklist would prefer to use it in a horizontal format as opposed to a vertical format, the Checklist was produced in both formats for the evaluation of the Module.

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[4]Dick, W. and Carey, L. *The Systematic Design of Instruction.* Scott, Foresman and Company: Glenview, IL, p. 5.

The Checklist consisted of a comprehensive set of tasks listed in abbreviated form for consideration by the aviator during the premission planning process. It was sequenced according to the chronology of the premission planning process. The Checklist was developed as a memory aid to reduce errors of omission and to minimize procedural variability.

The Checklist was organized into four planning steps based on the order in which they are to be carried out in premission planning. These are:

I. Acquire premission information

II. Conduct mission planning

III. Conduct contingency planning

IV. Conduct crew briefing and premission checks

The first step, *acquire premission information,* includes the tasks of receiving the operations order and collecting the information and materials which will be needed during later planning steps. This information includes such items as the latest intelligence information, Communications/Electronics Operating Instructions (CEOI), and weather information. Materials include maps, aerial photographs, overlays, etc.

The second step, *conduct mission planning,* includes the tasks which constitute planning the mission and determining all requirements associated with it. These tasks include map reconnaissance, assessment of information, mode(s) of flight selection, route selection, analysis of requirements, fire support coordination, and map annotation.

The third step, *conduct contingency planning,* includes the tasks involved in reviewing procedures for handling various emergencies and other contingencies. These tasks include review of contingencies for aircraft inflight emergencies, systems malfunctions, loss of communications, tactical contingencies, environmental contingencies, and escape routes. Many of these procedures may be found in unit Standard Operating Procedures (SOPs).

The fourth step, *conduct crew briefing and premission checks,* includes the tasks of briefing the crew, performing standard aircraft preflight and flight checks, and performing additional equipment and flight checks as dictated by the given mission. Specific procedures for standard preflight checks are prescribed by official checklists for the aircraft system.

While the Premission Planning Checklist generally serves the same function as other checklists, there is one important difference. Other types of checklists (e.g., the checklist in the aircraft operator's manuals), require rigid adherence to published procedures. However, rigid adherence to the Premission Planning Checklist is neither required nor desirable, because missions vary one from another. The Checklist was developed so that irrelevant tasks would be omitted. For example, a medical evacuation mission would not require consideration of armament.

Additionally, when mission urgency deprives the pilot of sufficient time to conduct thorough premission planning, he can go directly to Step IV of the Checklist.

Development of the Training Guide. A premission planning training module should be useful to a qualified Army aviator regardless of his experience and knowledge of premission planning requirements. The Premission Planning Checklist, containing tasks in abbreviated form, may be sufficient for the highly experienced aviator, but probably not for one with little experience nor for the aviator who has been assigned to non-flying duties for an extended period.

Therefore, in order to meet the second training objective, namely, determining how to perform each planning task, the Training Guide for Tactical Premission Planning (Appendix B) was developed. The Training Guide was intended to explain in more detail the manner in which each planning task listed in the comprehensive Checklist should be accomplished, and to refer the aviator to appropriate sources (e.g., field manuals, other personnel) to consult if additional information was needed. The organization of the Training Guide is identical to that of the Checklist.

For example, Step I of the Checklist tells the aviator to acquire premission information. Section I of the Training Guide (which corresponds to Step I of the Checklist) tells the aviator what information will be needed, where to find it, and how to make effective use of the information. This format, with specific sections of the Training Guide corresponding to specific steps in the Checklist, is repeated throughout the Training Guide.

As the Training Guide was formatted to correspond to the Checklist, it was revised on a continuing basis in conjunction with modifications of the Checklist. Like the Checklist, the Training Guide is flexible; it was designed to accept changes and additions. The three-ring binder facilitates changes to the Training Guide to suit the specific needs of a particular unit.

Development of the Check Sheet. The Premission Check Sheet (Appendix C) was developed during the second year of research to meet the third training objective, namely, to assess the effectiveness of premission planning. Like the Training Guide, the development of the Check Sheet was contingent on the eventual contents and configuration of the Checklist. On the basis of consultation with SMEs at USAAVNC and in operational units, those tasks in the Checklist which were considered most critical to mission accomplishment were identified and included in the Check Sheet.

The tasks on the Check Sheet are organized under the general headings of route planning, map annotation, mission communications, mission equipment check, mission planning, emergency/contingency preparation, and miscellaneous mission factors. The order of assessment tasks in the Check Sheet reflected the SMEs' judgments of the criticality of each task. The headings were determined by Canyon investigators after the generation of the assessment tasks.

Using the Check Sheet, the aviator checks whether or not he performed each task in conducting premission planning, or indicates that that task

is not applicable. The Check Sheet may be used by an aviator to assess his own premission planning performance (i.e., self-assessment), or to evaluate the performance of other aviators. Following self-assessment the aviator would be better able to determine individual training needs and to specify them to the unit IP.

The mission itself need not be flown to make use of the Check Sheet. However, the last section of the Check Sheet (Misc. Mission Factors) is used only if the planned mission is actually flown and is a further check on the thoroughness and effectiveness of premission planning.

Evaluation of the Module

Subjects. Air cavalry is the only type of Army aviation unit which routinely employs three separate helicopter systems in their combat missions--attack, scout, and assault. Therefore, two air cavalry squadrons located at two separate FORSCOM installations (referred to as location A and location B) were selected for evaluation of the Module. These units were considered by SMEs to be typical of air cavalry-type units. Forty pilots, twenty from each air cavalry squadron, served as subjects.

The two prerequisites for selection of subjects were that the aviators be classified in Flying Activity Category 1 (FAC 1) and that they be at Aviator Readiness Level (ARL) 1 or 2.[5] An aviator in FAC 1 is one who has a combat mission. An aviator at ARL 1 is one who has completed mission training and has begun, or is ready to begin, continuation training (i.e., that training which will sustain combat readiness). An aviator at ARL 2 is one who has completed qualification training and has begun, or is ready to begin mission training. Thus, FAC 1 ARL 2 was considered to be the lowest level at which the Module could be used to advantage because an aviator at a lower FAC or ARL would not be required to perform a tactical task requiring premission planning.

The subjects ranged in rank from Warrant Officer to Captain. Experience level, as measured by number of flying hours, ranged from 200 to 3,900 hours, with a mean of 1,402 hours. Hours of recent flying experience (i.e., within the last 90 days) ranged from 0 to 120 hours, with a mean of 50.5 hours. Approximately 25 percent of the subjects had combat flying experience (Vietnam). There was no significant overall difference between the two squadrons with regard to the level and variety of experience.

Data Collection Instruments. Evaluation data were gathered using four data collection instruments: (1) the Premission Planning Check Sheet; (2) the Introductory Questionnaire; (3) the Weekly Questionnaire; and (4) the Tactical Premission Planning Training Module Questionnaire. The Premission Planning Check Sheet (Appendix C) was developed originally as the assessment component of the Premission Planning Module. During the evaluation of the Module, the Check Sheet was used to record interview data concerning existing procedures for premission planning. It was used prior to the introduction of the Module and after a 90-day period of Module usage.

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[5]TC 1-134. Commander's Guide for Utilization of Aircrew Training Manuals, September 1978.

The Introductory Questionnaire (Appendix D), administered prior to the introduction of the Module, served two purposes. The primary purpose was to obtain demographic information (e.g., date rated as an aviator, number of flying hours, etc.). In addition, it was utilized to solicit the subjects' opinions about present premission planning in their units, the perceived need for a training module for different candidate training topics, and the perceived ability of aviators to assess their own performance. This information was collected to validate the analysis of training requirements done as part of the first year's research.

Two of the candidate training topics, "Night Terrain Flight" and "Premission Planning," were selected because they were identified in the first year's research as being applicable to all missions. Two other topics, "Electronic Warfare" (EW) and "Nuclear, Biological, Chemical" (NBC), were selected because the Army has identified the urgency to train aviators to operate in EW and NBC environments. Six different types of air cavalry-type missions were selected as the remaining candidate training topics because the subjects (aviators in air cavalry units) were considered to be best qualified to judge the need for a training module for these topics.

The Weekly Questionnaire (Appendix E), was designed to obtain information from the subjects regarding their experience with the Module during the previous week. The purpose of the questionnaire was to keep a continuing record of the number and type of missions which had been flown, the resources used in planning, parts of the training module used, and method of module utilization.

The Tactical Premission Planning Training Module Questionnaire (also referred to as the "Module Questionnaire") was designed to obtain data, after a period of Module usage, reflecting the usefulness and acceptability of the Module as well as its shortcomings in an operational environment. This questionnaire is given in Appendix F. Subjects responding to this questionnaire indicated their level of agreement or disagreement with several statements about the components and use of the Module. Subjects were encouraged to express an opinion that could not be adequately reflected by checking one of the rating categories.

Procedures. Data were collected from operational units which were intended to be users of the Module. This source of data resulted in two limitations on the research procedures which were recognized by the researchers. First, unit integrity must be preserved. That is, subjects assigned to the smallest existing organizational unit--the troop--could not be assigned differentially to treatment groups. Second, data collection must be conducted with a minimum of interference with ongoing operations. These restrictions meant that random assignment of subjects to treatment groups was inappropriate.

A four-group design was adopted for data collection and analysis. The two troops in the aviation squadron at location A were designated treatment groups 1 and 2 respectively; the two troops in the aviation squadron at location B were designated treatment groups 3 and 4 respectively.

There were three phases of data collection. During an initial data collection visit to the units (Phase 1) subjects from groups 1 and 2 were interviewed, using the Check Sheet as a data collection instrument to

record premission planning behavior data. Questions which could be answered "yes" or "no" were avoided; rather, subjects were encouraged to describe fully what premission planning they had done.

Subjects from all four groups were administered the Introductory Questionnaire. Data collected during the initial visit were intended to summarize subjects' premission planning behavior and opinions before they were given the opportunity to use the Module. In addition, the Module was introduced to groups 1 and 3, and the conditions of its usage explained.

During the ensuing Module use period lasting approximately 90 days (Phase 2), subjects from groups 1 and 3 were given the opportunity to use the Module and respond to the Weekly Questionnaire. During this period no restrictions were placed on the way that the Module was to be used and no special missions were flown because of the Module. The Weekly Questionnaires were returned by mail to the researchers through an officer of each unit, appointed for that purpose.

During a follow-up visit to the units (Phase 3), subjects from all four groups were interviewed using the Check Sheet to record premission planning behavior which had occurred during the Module use period. Those subjects who had been given the opportunity to use the Module (groups 1 and 3) were administered the Module Questionnaire. These data were collected in order to summarize subjects' premission planning behavior and opinions about the Module after they were given an opportunity to use the Module.

These procedures are summarized by Table 1 which presents the three phases of data collection, the size and location of the treatment groups, and the scheduling of the data collection activities.

Table 1

Summary of Data Collection

Treatment Group	Size	Location	Response Categories: Interview Using Check Sheet	Introductory Questionnaire	Training Module	Weekly Questionnaire	Interview Using Check Sheet	Training Module Questionnaire
1	10	A	X	X	X	X	X	X
2	10	A	X	X			X	
3	10	B		X	X	X	X	X
4	10	B		X			X	
			Initial Data Collection Visit		Module Usage Period (90 days)		Follow-Up Data Collection Visit	
Phase of Data Collection			1		2		3	

RESULTS

Due to subject attrition and low response rates, data were not available from the Weekly Questionnaire and the second interview using the Check Sheet. Usable data were available only from the first interview using the Check Sheet, the Introductory Questionnaires (both administered during the initial visit to the units), and from the Module Questionnaire administered after the Module use period. In addition, there were missing data on several items of these data collection instruments. Descriptive statistics were employed to summarize the available data.

Premission Planning Behavior Data

Data were gathered from all 20 subjects who were interviewed using the Check Sheet during the initial visit. Of the 43 planning tasks on the Check Sheet, an average of 3.6 tasks were mentioned by subjects in describing their premission planning activities. Seven of the 20 subjects stated that no planning whatsoever had been accomplished; four of these 7 subjects were AH-1 pilots and 3 were UH-1 pilots. These results indicated that relatively little premission planning was being done in one operational unit before subjects were given the opportunity to use the Module.

Introductory Questionnaire Data

Comparison of the responses of all four groups to the items on the Introductory Questionnaire indicated no major differences in the overall pattern of responses among groups. Because of this and because of the small sample sizes involved, responses to the items in the Introductory Questionnaire were averaged across all subjects responding to this questionnaire and are summarized in Tables 2 through 4. The entries in the body of each table are percentages of subjects who checked a given scale value for each item. The sum of the percentages across rating scale categories may not equal 100 due to rounding error.

In order to identify missions which might benefit from the use of a premission planning training module, subjects were asked to rate the difficulty of planning and executing six different air cavalry-type missions. Subjects' responses are summarized in Table 2 (Difficulty of Planning) and Table 3 (Difficulty of Execution). Average scale values ($\bar{X}$) are given in addition to percentages.

Table 2

Summary of Ratings for Difficulty of Planning for Missions

Mission	n[a]	$\bar{X}$[b]	Response Categories: Extremely Difficult (5)	Difficult (4)	Average (3)	Easy (2)	Very Easy (1)
Rapid Reaction Forces	26	3.69	8	54	35	4	0
Advanced Guard	25	3.48	4	48	40	8	0
Screening Operations	27	3.16	4	30	44	22	0
Zone Recon	29	3.07	3	17	69	7	3
Area Recon	29	3.00	0	17	66	17	0
Route Recon	29	2.83	0	14	62	17	7

Note. Data listed below response categories are percentages.
[a]Number of subjects responsing to each mission.
[b]Average scale value: Extremely Difficult = 5, Very Easy = 1.

Table 3

Summary of Ratings for Difficulty of Executing Missions

Mission	n[a]	$\bar{X}$[b]	Response Categories: Extremely Difficult (5)	Difficult (4)	Average (3)	Easy (2)	Very Easy (1)
Rapid Reaction Forces	25	3.68	16	44	32	8	0
Advanced Guard	25	3.52	4	52	36	8	0
Screening Operations	26	3.32	8	31	46	15	0
Zone Recon	37	3.30	4	30	56	11	0
Area Recon	28	3.00	0	18	64	18	4

Note. Data listed below response categories are percentages.
[a]Number of subjects responding to each mission.
[b]Average scale value: Extremely Difficult = 5, Very Easy = 1.

With respect to the data presented in Tables 2 and 3, it is important to note that the average rating scale values of the six air cavalry-type missions were in identical rank order for two criteria: perceived difficulty of planning and perceived difficulty of execution. In other words, those missions which were rated as most difficult to plan were also rated as most difficult to execute. Assuming that both planning and execution can be facilitated by a more systematic approach to premission planning, these results identify the types of air cavalry-type missions that are most likely to benefit from a training module.

The subjects also rated the need for a training module for each of ten separate candidate training topics on the Introductory Questionnaire. As was mentioned previously, these data were obtained to validate the results of the analysis of training requirements performed during the first year of research. Subjects' responses are summarized in Table 4. Average scale values ($\bar{X}$) are given in addition to percentages.

Table 4

Summary of Ratings for Need for Module

Candidate Training Topics	n[a]	$\bar{X}$[b]	Response Categories: Very Urgently Needed (5)	Urgently Needed (4)	Needed (3)	Not Needed (2)	Definitely Not Needed (1)
Night Terrain Flight	25	3.88	24	40	36	0	0
Electronic Warfare (EW)	24	3.87	33	25	38	4	0
Nuclear, Biological, Chemical (NBC)	25	3.60	24	28	36	8	4
Premission Planning	25	3.56	16	32	44	8	0
Rapid Reaction Force	24	3.42	8	33	54	4	0
Advanced Guard	24	3.21	0	25	71	4	0
Route Recon	25	3.16	0	20	76	4	0
Screening Operations	24	3.13	0	17	79	4	0
Zone Recon	25	3.12	0	20	72	8	0
Area Recon	25	3.08	0	16	76	8	0

Note. Data listed below response categories are percentages.
[a]Number of subjects responding to each candidate training topic.
[b]Average scale value: Very Urgently Needed = 5, Definitely Not Needed = 1.

Subjects indicated a need for a training module for all of the candidate training topics identified in the Introductory Questionnaire. The expressed need was high for the topics of Night Terrain Flight and Premission Planning, thus supporting the results of the analysis of training requirements. At least a moderate amount of need (i.e., an average rating scale value greater than 3.00) was expressed for the remainder of the candidate training topics.

Additional data were obtained from the Introductory Questionnaire regarding the organization and effectiveness of premission planning in the subjects' units as well as the possible contribution of inadequate premission planning to mission failure. When asked to rate premission planning performance in their unit in terms of its organization, more subjects rated premission planning as unorganized (55%) than organized (38%). There were 29 subjects responding to this item.

Of the 28 subjects who rated their unit's premission planning performance in terms of its effectiveness, an equal number of subjects considered premission planning to be effective (46%) as ineffective (46%). It is

important to note that subjects were reminded, while completing the Introductory Questionnaire, that no particular relationship should be inferred between how well organized premission planning was and how effective it was.

Of the 30 subjects who rated the frequency of mission failure in their unit caused by inadequate premission planning, approximately the same number of subjects indicated that mission failure occurred frequently (30%) as infrequently (27%). Thus, in general, the subjects indicated that premission planning in their units was unorganized, not very effective, and possibly contributing to mission failure.

Finally, as an indication of the potential value of the Check Sheet for self-assessment, subjects were asked to rate the ability of aviators to evaluate their own performance. More than half of the subjects (52%) agreed that aviators could evaluate their own performance accurately, given well defined performance standards.

Module Questionnaire Data

Responses to the Module Questionnaire were sought from the 20 subjects who were given the opportunity to use the Module. However, due to transfers, sickness, and leaves, only 15 subjects (8 from group 1, and 7 from group 3) completed the questionnaire. Some subjects did not respond to all questionnaire items. Thus, the number of subjects responding to most items on the Module Questionnaire ranged from 13 to 15. Only those subjects who had graduated from flight school within the past 12 months were asked to respond to items 22 and 23; these items had 7 respondents.

Comparison of the responses of subjects from groups 1 and 3 revealed no major differences in the overall pattern of results. Because of this and because of the small sample size involved, responses to the items in the Module Questionnaire were averaged across all subjects responding to the questionnaire and are summarized in Table 5. The entries in Table 5 are percentages of respondents who checked a scale value for the items on the Module Questionnaire. Due to space limitations, the items appearing in the lefthand column are abbreviated forms of the corresponding items on the Module Questionnaire (Appendix F).

It was evident from several sources (e.g., lack of returned Weekly Questionnaires, interviews using the Check Sheet conducted during the follow-up visit, comments on the Module Questionnaire, discussions held with subjects during the follow-up visit) that neither group 1 nor group 3 used the Module very often during the Module usage period. The opportunity of subjects in group 1 to use the Module was limited because few tactical training missions were scheduled. Subjects in group 3 were involved in a tactical training exercise during the Module use period. However, insufficient time was allowed in their unit to plan missions during this exercise. Because of this, restraint should be exercised in the interpretation of the Module Questionnaire data.

Table 5

Summary of the Results of the
Tactical Premission Planning Training Module Questionnaire

No.	Item	n[a]	Response Categories: Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
1	The Module was helpful to me personally	14	0	7	7	7	57	22
2	The Module was easy to use in a unit training environment	15	7	0	0	43	43	7
3	The Module is compatible with day-to-day unit operations	14	14	21	14	21	21	7
4	The Module was difficult to use (special mission requirements)	14	0	46	0	46	8	0
5	The Module was difficult to use (geographical considerations)	15	23	39	16	23	0	0
6	The Module is adaptable to any geographical location	14	0	0	7	14	42	37
7	The oral introduction to the Module was clear and complete	15	0	0	7	7	46	46
8	The materials in the Module were clear	15	0	0	7	0	60	33
9	The materials in the Module were complete for my needs	13	0	0	0	8	69	23
10	The Module would be useful for planning area recon missions	14	0	0	0	7	79	14
11	The Module would be useful for planning route recon missions	14	0	0	0	14	71	15
12	The Module would be useful for planning zone recon missions	14	0	0	0	7	79	14
13	The Module would be useful for planning advance guard missions	13	0	0	0	31	54	15

Note. Data listed below the response categories are percentages. The percentages may not sum to 100 across response categories due to rounding error.

[a]Number of subjects responding to each item.

Table 5 - Cont'd

Summary of the Results of the
Tactical Premission Planning Training Module Questionnaire

No.	Item	n[a]	Response Categories: Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
14	The Module would be useful for planning screening missions	14	0	0	0	21	64	15
15	The Module would be useful for planning rapid reaction force missions	13	7	13	13	40	13	13
16	The Module would be useful for planning any VFR mission	15	0	0	14	14	29	43
17	The Guidelines for Use provided adequate instructions	15	0	0	0	14	64	22
18	The Checklist was useful as an aid for premission planning	15	0	0	0	7	29	64
19	The Training Guide was useful as a self-teaching device	14	0	0	0	43	36	21
20	The Check Sheet was useful to check effectiveness of own premission planning	15	0	0	7	21	57	14
21	Self-assessment, using the Check Sheet, can improve my performance in premission planning	14	0	0	0	36	43	21
22	Premission planning training in flight school was adequate	7	0	0	29	43	14	14
23	The Module should be in flight school curriculum	7	0	0	0	14	43	43
24	The Module would be useful to me as long as I fly	15	0	0	7	29	43	21

Note. Data listed below the response categories are percentages. The percentages may not sum to 100 across response categories due to rounding error.

[a]Number of subjects responding to each item.

Table 5 - Cont'd

Summary of the Results of the
Tactical Premission Planning Training Module Questionnaire

No.	Item	n[a]	Response Categories: Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
25	I would like a copy of the Module for my personal library	15	0	0	0	14	14	72
26	I would prefer this format for the Checklist	14	Vertical: 86			Horizontal: 14		

Note. Data listed below the response categories are percentages. The percentages may not sum to 100 across response categories due to rounding error.
[a]Number of subjects responding to each item.

In general, the overall pattern of responses in the Module Questionnaire indicated a positive reaction by the subjects to the Module. All three components comprising the Module (the Checklist, the Training Guide, and the Check Sheet) were judged to be useful, with the Checklist being rated somewhat more useful than the Check Sheet or the Training Guide. Subjects felt that the materials within the Module were clear and complete for their needs. The vertical format for the Checklist was preferred over the horizontal format.

Regarding the types of missions for which the Module might be appropriate, subjects rated it to be less useful for rapid reaction force missions than for the other five air cavalry-type missions. This finding appeared to reflect an opinion expressed by the subjects that a rapid reaction force mission lacks a predesignated destination and the specific mission characteristics necessary for detailed premission planning.

Subjects' responses were equivocal with regard to the judged compatibility of the Module with day-to-day operations. A small number of "strongly disagree" responses was given to the item concerning the ease of the use of the Module in a unit training environment. The reason for these results, explained in informal discussions and written comments, was that sufficient time was not available to conduct premission planning in the subjects' units.

The Module Questionnaire results support the use of the Module in institutional training. Subjects expressed some disagreement that premission planning training in flight school was adequate; furthermore, they indicated a strong desire to have the Module included in the flight school curriculum.

These results suggest that the Module be incorporated into the curriculum during institutional training. This contention is supported by the early adoption of the Checklist into Combat Skills Training at the Aviation Center. This action followed review of the Module by SMEs from the Aeroscout branch of the Department of Flight Training.

One concern of this research was the potential of the Module to aid in self-assessment through use of the Check Sheet. Subjects agreed that the Check Sheet was useful for checking the effectiveness of their own premission planning and that self-assessment could improve their performance in premission planning. This is supported by moderate agreement to the item in the Introductory Questionnaire concerning the ability of aviators to assess their own performance, given well defined standards. Taken together, these data suggest that the Check Sheet is a valuable tool for self-assessment.

An additional indication of the subjects' positive evaluation of the Module is the high level of agreement to the item asking if they would like a copy of the Module for their personal library. The response to this item, taken together with the overall positive response to the other items on the Module Questionnaire, suggests that the Module should be distributed to aviators in operational units through Army training literature distribution channels.

CONCLUSIONS

Three general conclusions can be drawn from the results of this research. First, a definite need was expressed by Army aviators in operational units for a more formal, systematic process of premission planning. Second, the Tactical Premission Planning Training Module, in its present form, was evaluated by the aviators who participated in this research as acceptable and useful in satisfying their perceived need for a more formal, systematic method of training premission planning. And third, merely providing aviators with a module is not sufficient to insure either adequate premission planning performance or the maximum utilization of any such module; organizational intent to require systematic and thorough mission planning is essential.

It is premature to draw any conclusions concerning the utility of the Module. In this context, utility is regarded as the extent to which the Module improved training above and beyond methods which currently are being used. This includes the case in which no training at all is being conducted. It is suggested that additional research be undertaken to determine the utility of the Tactical Premission Planning Training Module in unit training and that this research have the necessary organizational support. A related avenue of research that should be pursued is the determination of the utility of the Module in institutional training.

The results of this investigation suggest several steps that should be taken to increase the future success and utilization of the Module in a field setting. First, as was done in this research effort, sufficient care should be taken at the beginning of the utilization period to introduce and explain the Module, focusing on its purpose, contents, proper use, and potential benefits. Second, both encouragement and support for use of the Module should come from the unit commander. The commander should be involved directly from the beginning of the utilization period.

Third, as much of the unit as possible should be given the opportunity to use the Module--preferably the whole unit. This should be done in order to minimize the disruptive effects on a unit's normal training program that may result when special training materials and techniques are made available to some unit members to the exclusion of others. And fourth, the commander should insure that the aviators using the Module are provided with realistic tactical training missions and are given the time to plan those missions.

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3. TRADOC Pamphlet 350-30. Interservice Procedures for Instructional Systems Development: Executive Summary and Model. August 1975.

4. Dick, W. and Carey, L. *The Systematic Design of Instruction.* Scott, Foresman and Company: Glenview, IL., p. 5.

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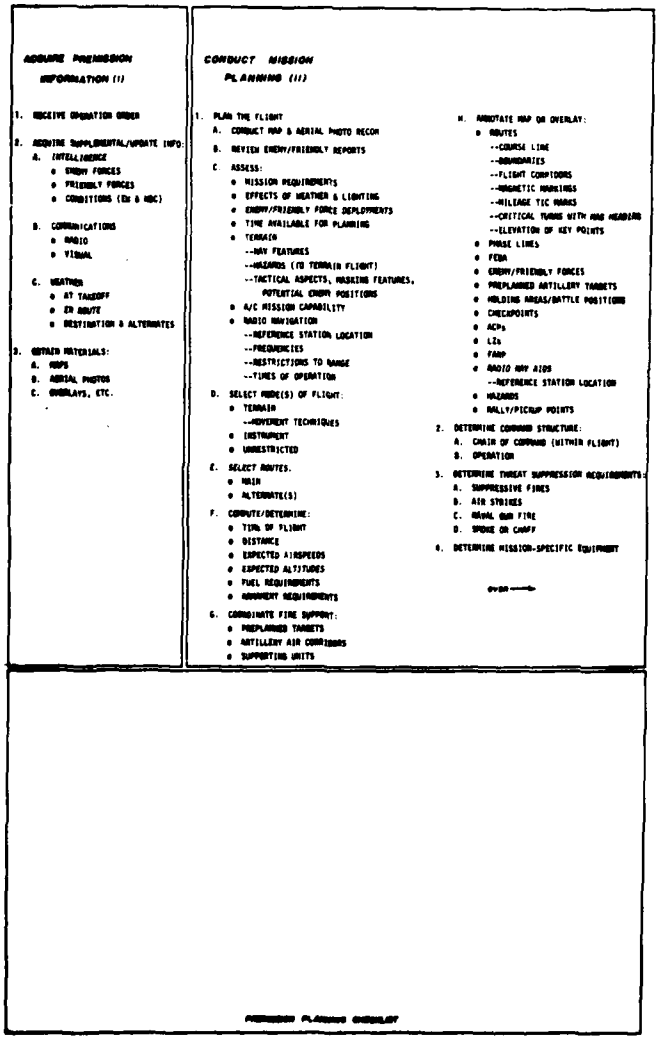


ACQUIRE PREMISSION INFORMATION (I)

1. RECEIVE OPERATION ORDER
2. ACQUIRE SUPPLEMENTAL/UPDATE INFO:
   A. INTELLIGENCE
      - ENEMY FORCES
      - FRIENDLY FORCES
      - CONDITIONS (EW & NBC)
   B. COMMUNICATIONS
      - RADIO
      - VISUAL
   C. WEATHER
      - AT TAKEOFF
      - EN ROUTE
      - DESTINATION & ALTERNATES
3. OBTAIN MATERIALS:
   A. MAPS
   B. AERIAL PHOTOS
   C. OVERLAYS, ETC.

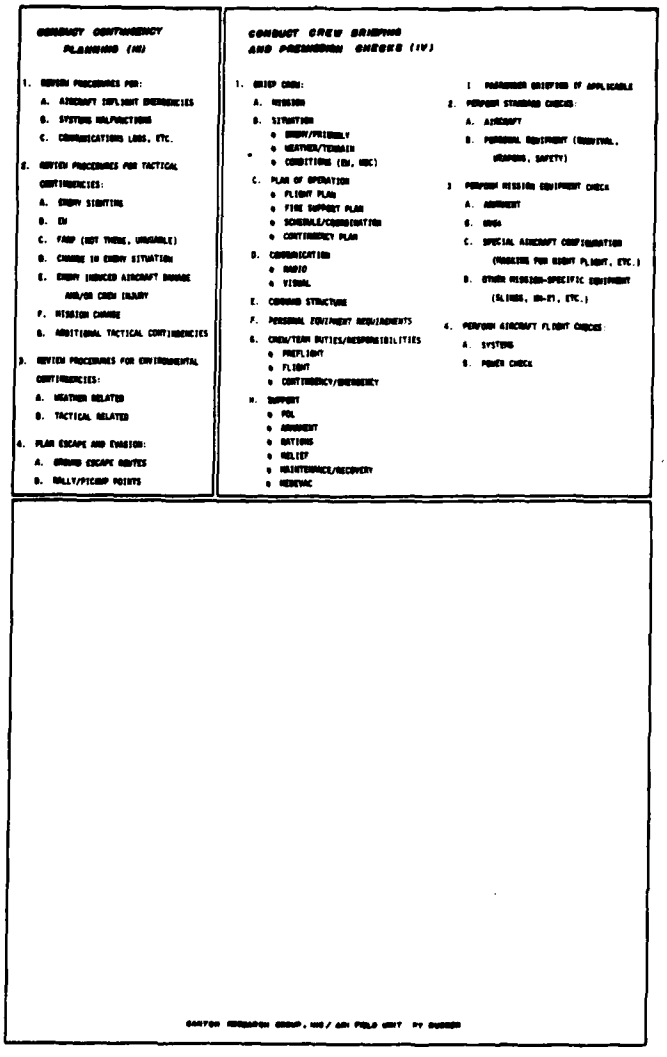
CONDUCT MISSION PLANNING (II)

1. PLAN THE FLIGHT
   A. CONDUCT MAP & AERIAL PHOTO RECON
   B. REVIEW ENEMY/FRIENDLY REPORTS
   C. ASSESS:
      - MISSION REQUIREMENTS
      - EFFECTS OF WEATHER & LIGHTING
      - ENEMY/FRIENDLY FORCE DEPLOYMENTS
      - TIME AVAILABLE FOR PLANNING
      - TERRAIN
        --NAV FEATURES
        --HAZARDS (TO TERRAIN FLIGHT)
        --TACTICAL ASPECTS, MASKING FEATURES, POTENTIAL ENEMY POSITIONS
      - A/C MISSION CAPABILITY
      - RADIO NAVIGATION
        --REFERENCE STATION LOCATION
        --FREQUENCIES
        --RESTRICTIONS TO RANGE
        --TIMES OF OPERATION
   D. SELECT MODE(S) OF FLIGHT:
      - TERRAIN
        --MOVEMENT TECHNIQUES
      - INSTRUMENT
      - UNRESTRICTED
   E. SELECT ROUTES.
      - MAIN
      - ALTERNATE(S)
   F. COMPUTE/DETERMINE:
      - TIME OF FLIGHT
      - DISTANCE
      - EXPECTED AIRSPEEDS
      - EXPECTED ALTITUDES
      - FUEL REQUIREMENTS
      - ARMAMENT REQUIREMENTS
   G. COORDINATE FIRE SUPPORT:
      - PREPLANNED TARGETS
      - ARTILLERY AIR CORRIDORS
      - SUPPORTING UNITS
   H. ANNOTATE MAP OR OVERLAY:
      - ROUTES
        --COURSE LINE
        --BOUNDARIES
        --FLIGHT CORRIDORS
        --MAGNETIC HEADINGS
        --MILEAGE TIC MARKS
        --CRITICAL TURNS WITH ANS HEADING
        --ELEVATION OF KEY POINTS
      - PHASE LINES
      - FEBA
      - ENEMY/FRIENDLY FORCES
      - PREPLANNED ARTILLERY TARGETS
      - HOLDING AREAS/BATTLE POSITIONS
      - CHECKPOINTS
      - ACPs
      - LZs
      - FARP
      - RADIO NAV AIDS
        --REFERENCE STATION LOCATION
      - HAZARDS
      - RALLY/PICKUP POINTS
2. DETERMINE COMMAND STRUCTURE:
   A. CHAIN OF COMMAND (WITHIN FLIGHT)
   B. OPERATION
3. DETERMINE THREAT SUPPRESSION REQUIREMENTS:
   A. SUPPRESSIVE FIRES
   B. AIR STRIKES
   C. NAVAL GUN FIRE
   D. SMOKE OR CHAFF
4. DETERMINE MISSION-SPECIFIC EQUIPMENT

over →

PREMISSION PLANNING OVERLAY

Side 1



CONDUCT CONTINGENCY PLANNING (III)

1. REVIEW PROCEDURES FOR:
   A. AIRCRAFT INFLIGHT EMERGENCIES
   B. SYSTEMS MALFUNCTIONS
   C. COMMUNICATIONS LOSS, ETC.
2. REVIEW PROCEDURES FOR TACTICAL CONTINGENCIES:
   A. ENEMY SIGHTING
   B. EW
   C. FARP (NOT THERE, UNAVAILABLE)
   D. CHANGE IN ENEMY SITUATION
   E. ENEMY INDUCED AIRCRAFT DAMAGE AND/OR CREW INJURY
   F. MISSION CHANGE
   G. ADDITIONAL TACTICAL CONTINGENCIES
3. REVIEW PROCEDURES FOR ENVIRONMENTAL CONTINGENCIES:
   A. WEATHER RELATED
   B. TACTICAL RELATED
4. PLAN ESCAPE AND EVASION:
   A. GROUND ESCAPE ROUTES
   B. RALLY/PICKUP POINTS

CONDUCT CREW BRIEFING AND PREMISSION CHECKS (IV)

1. BRIEF CREW:
   A. MISSION
   B. SITUATION
      - ENEMY/FRIENDLY
      - WEATHER/TERRAIN
      - CONDITIONS (EW, NBC)
   C. PLAN OF OPERATION
      - FLIGHT PLAN
      - FIRE SUPPORT PLAN
      - SCHEDULE/COORDINATION
      - CONTINGENCY PLAN
   D. COMMUNICATION
      - RADIO
      - VISUAL
   E. COMMAND STRUCTURE
   F. PERSONAL EQUIPMENT REQUIREMENTS
   G. CREW/TEAM DUTIES/RESPONSIBILITIES
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   H. SUPPORT
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   I. PARAMEDIC BRIEFING IF APPLICABLE
2. PERFORM STANDARD CHECKS:
   A. AIRCRAFT
   B. PERSONAL EQUIPMENT (SURVIVAL, WEAPONS, SAFETY)
3. PERFORM MISSION EQUIPMENT CHECK
   A. ARMAMENT
   B. GUNS
   C. SPECIAL AIRCRAFT CONFIGURATION (MODIFIED FOR NIGHT FLIGHT, ETC.)
   D. OTHER MISSION-SPECIFIC EQUIPMENT (SLINGS, NV-MT, ETC.)
4. PERFORM AIRCRAFT FLIGHT CHECKS:
   A. SYSTEMS
   B. POWER CHECK

DAYTON RESEARCH GROUP, USE / AFH FIELD UNIT PY DUNBAR

Side 2

APPENDIX B TRAINING GUIDE FOR PREMISSION PLANNING [1]

INTRODUCTION: The sheer numbers and variety of tactical considerations and contingencies which directly influence the outcome of a mission demand that premission planning be as thorough and complete as time permits. Premission planning ranks as one of the single most important aspects of any mission in terms of its influence on the success or failure of the mission. Additionally, since time is usually of the essence in a combat situation, as much planning as possible must be accomplished with the least possible expenditure of time. The best means to achieve these imperatives (thorough premission planning with the least expenditure of time) is to consolidate and systematize the premission planning process. That is the principal value of this document.

PURPOSE: The purpose of this Training Guide is to provide a detailed consolidated reference for tactical premission planning. It is designed to be used in conjunction with the Premission Planning Checklist either in the training environment or in the field. As such, it is formatted to correspond to each item in the Premission Planning Checklist. Because this Training Guide is a consolidated reference, there are some procedures and techniques which will be either redundant or unnecessary depending on the particular mission. Final responsibility for determining which procedures and techniques apply to a particular mission rests, as always, with the pilot.

Because the resources applicable to premission planning are not always found in obvious places, this Training Guide

should prove invaluable as a "one source" document for tactical premission planning. The repetitive use of the Premission Planning Checklist and this Training Guide will increase the pilot's ability to plan missions rapidly and accurately in the least possible time.

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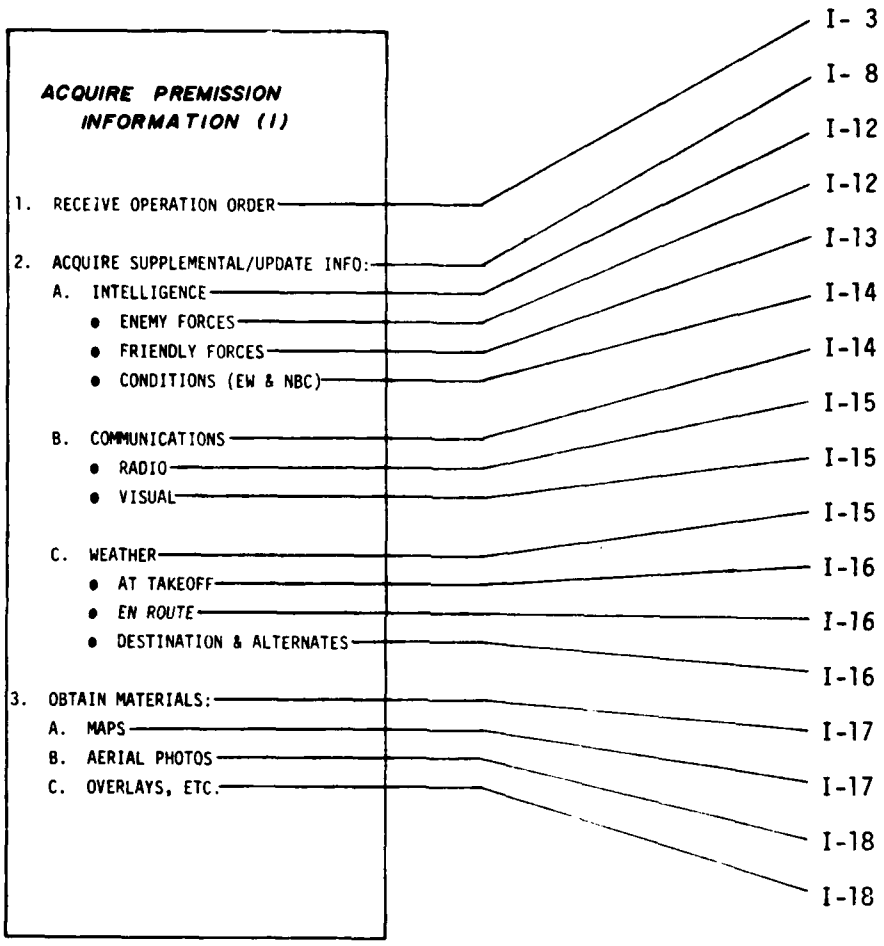
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ACQUIRE PREMISSION PLANNING INFORMATION (I)*

Information on which to base premission planning can come from a wide variety of sources and be in many different forms. The obvious first step is to acquire all the materials and information prior to conducting the actual planning.

This section consists of an explanation of the operations order and the additional information and materials to be gathered as listed in the Premission Planning Checklist.

*Throughout this document asterisked items are from the Premission Planning Checklist.

1. RECEIVE OPERATION ORDER*

The operations order is the foundation on which the building blocks of additional planning are laid. The order usually is obtained from the operations officer, and it may be presented in either of the following three formats:

a. The standard five paragraph OPerations ORDer (OPORD), complete with annexes, where the pilot must extract the information pertinent to his mission.

b. A written FRAGmentary ORDer (FRAGORD) which will contain only the information pertinent to the specific mission.

c. An oral order from the operations officer, which also will contain only the information pertinent to the pilot's mission.

Following is an outline of the information contained in an operations order. You may receive part or all of this information, depending upon need or time available. It is important that you become familiar with the information provided in the operations order. Even though you may receive only a FRAG order or oral order, you may require more detailed information than is provided in either. The operations order format is provided first, followed by a more detailed explanation about what information is available in each paragraph of the order.

OPERATIONS ORDER FORMAT
Task Organization 1. SITUATION a. Enemy b. Friendly c. Attachments and Detachments 2. MISSION 3. EXECUTION --Concept of operation • maneuver • fire support --Coordinating instructions 4. SERVICE SUPPORT 5. COMMAND AND SIGNAL

Task organization: Organization for combat is developed by the G-3, based on the commander's decision and his concept, if given, and in coordination with staff officers having responsibilities in combat and combat support operations. Selection of specific units, except for maneuver battalions, is the prerogative of unit commanders, who provide unit designations to the staff officer concerned.

1. SITUATION: Subparagraph a. is provided by the G-2 and contains enemy information only. Instructions are not included. Reference may be made to an intelligence annex, operation overlay (if enemy information is shown), periodic intelligence report, or intelligence summary. Only enemy information vital to the entire command is included. Subparagraph b. is extracted by the G-3 from the operations order of the next higher headquarters. This subparagraph contains information concerning higher, adjacent, support, and reinforcing units, as applicable. Information is limited to that which subordinate commanders need to know to accomplish their assigned mission. Subparagraph c. also is determined by the G-3 from the operations order of the next higher headquarters, units which are attached to or detached from, the division. If these units are listed in "Task Organization," they are not included in subparagraph c.

2. MISSION: The mission is a clear, concise statement of the task to be accomplished by the command. It will include those tasks specified by the higher headquarters directing the operation

and those implied tasks determined by the commander as a result of his mission analysis to be essential for clarity. The statement normally describes WHO, WHAT, WHEN, and, as appropriate, WHY and WHERE. This paragraph has no subparagraphs. The mission is stated in full, even if portions are shown on the overlay.

3. EXECUTION: Subparagraph a. of the execution paragraph is the concept of operation. It states the scheme of maneuver and plan of the support. It includes priority of artillery fire, when appropriate; and, if a preparation is to be fired, its time and duration. It may also include the commander's visualization of the conduct of the overall operation; it may clarify the purpose of the operation, discussing phasing (if the operation has been phased), and employment of nuclear and chemical fires. This subparagraph may be divided into subparagraphs (as shown in outline above) covering maneuver and fires. The maneuver subparagraph may be further subdivided by phase, e.g., Phase I, Phase II, etc. The concept of operation subparagraph

normally will reference the operation overlay annex. The fire subparagraph normally will reference the fire support annex.

4. SERVICE SUPPORT: This paragraph will contain information pertinent to materiel, services, and transportation, and if instructions are numerous or voluminous, may reference one or more annexes. Information pertinent to Class III and Class V materiel, basic loads, and special ammunition loads are included.

5. COMMAND AND SIGNAL: This paragraph contains command and signal instructions. As a minimum, reference will be made to the communications-electronics annex (if used), current index to the Communications-Electronics Operating Instructions (CEOI), and the location of the division command post and axis of command post displacement (unless shown graphically).

Combat aviation units normally will use the FRAG order in lieu of the complete operations order. The purpose of the FRAG order is to provide specific and timely instructions without

loss of clarity. Elements normally found in a complete order are omitted whenever they have not changed, are not essential to the mission, or are incomplete at the time of issue. A FRAG order has no prescribed format. However, for the sake of clarity and ease of understanding, the standard five paragraph OPORD format is preferred. You may receive your mission by way of a briefing and have no OPORD or FRAGORD issued. Therefore, it becomes important that you know what kind of information is in an OPORD, so that you can take good notes and ask appropriate questions at the briefing. Sample 1 is an example of an OPORD.

2. ACQUIRE SUPPLEMENTAL/UPDATE INFORMATION:*

Upon receipt of your mission, whether it be in the form of an OPORD, a FRAG order, or an oral order from the operations officer, the first step in planning the mission is to briefly analyze the mission to determine the basic requirements that are inherent in it. For example, if you know whether the mission is a single aircraft flight, a multiple aircraft operation, or a multiple sortie mission, it will significantly affect your planning process. A brief mission analysis will insure that you take all necessary subsequent steps and that you omit unnecessary steps.

After the basic requirements of your mission have been determined, your first stop should be the operations map. It contains a wealth of information: it is annotated with locations of every pertinent detail in the area of operations (antiaircraft

Sample 1

Copy No. 3 of 18 copies
1-215 Air Cav Sqdn
KALBENSTEINBERG
(WV3448) GERMANY
140800A Jun 19____
RJS 7

OPORD 42
Reference: Map, series M27 GERMANY, sheets L7722, L7726, and L7720 (NURNBERG, AMBERG and REGENSBURG), edition 1-AMS, 1:250,000.
Time Zone Used Throughout the Order: ALFA.

* * * * * * * * *

1. SITUATION
   a. Enemy Forces.
      (1) Disposition. INTSUM 749.
      (2) Strength. 1st (US) Corps is currently opposed by 5 Aggressor motorized rifle divisions and 1 tank division, which are elements of the 19 and 9 Combined Arms Armies. They are at 100 percent strength.
      (3) Capability. Aggressor can attack, defend, or he can reinforce with at least 1 tank and motorized rifle div within 36 hours. 13 Air Army could employ in our sector 25 sorties daily of attack/fighter acft and has 20 nuclear weapons available for the next 9 days.
      (4) Probable course of action. Recent activity indicates that Aggressor will attack all along corps front within 36 to 48 hrs with 5 motorized rifle divisions and 1 tank division supported by all available artillery and air.
   b. Friendly Forces.
      (1) 25th Armd Div occupies line SANDRA (IDP) by 150900 Jun and covers 1st (US) Corps with 1st, 2d. and 3d Bde's abreast from west to east; hold enemy fwd of GOP until 170400 Jun; withdraw through GOP to assembly area and become corps reserve.
      (2) 4th (FRG) Corps on the left defends in sector from OW752650 to PV790685, with 3d Panzer Grenadier Div as corps covering force.
      (3) 2d (US) Corps on the right defends from QV972750 to RV865492, with 26th Armd Div as corps covering force.
      (4) Elm 9th TAF spt 25th Armd Div.
      (5) Priority of 25th Armd Div fires to 1-215 Air Cav Sqdn until withdrawal through GOP.
   c. Attachments and Detachments. None.

2. MISSION
   1-215 Air Cav Sqdn screen along PL ELAINE commencing 150900 Jun; on O withdraw to line SANDRA and provide spt to fwd bdes; after withdrawal through GOP revert to corps control.

Cont'd

Sample 1

3. EXECUTION
   a. Concept of Operation.
      (1) Maneuver. Sqdn establishes screen in zone with 3 air cav troops and 1 armd cav troop abreast, Trps A, B, D, and C from left to right; upon withdrawal to line SANDRA, sqdn supports fwd bdes with Trp A supporting 1st Bde, Trp B supporting 2d Bde, and Trp C supporting 3d Bde; Trp D prep to reinforce anywhere in sqdn sector.
      (2) Fires: Pri of fires to Trp D until withdrawal.
   b. Trp A:
   c. Trp B: Spt Trp D with aeroscout elms to screen trp front until withdrawal.
   d. Trp C:
   e. Trp D: On O withdraw in 2d Bde sector.
   f. Coordinating Instructions. None.

4. SERVICE SUPPORT
   a. General. Sqdn tns QV362495 (2d Bde tns area). Move on order.
   b. Materiel and Services.
      (1) Supply.
         (a) Class IIIa and V: (Units obtain class IIIA and V from refuel/rearm sites.) FARRP collocate with squadron.
         (b) Water. Units use WSP of 2d Bde.
      (2) Maintenance.
         (a) Track and wheel vehicles use maintenance collection points (TBA).
         (b) Aircraft evacuation coordinated through sqdn S4.
   c. Medical Evacuation and Hospitalization.
      (1) Evac to 2d Bde clearing station init.
      (2) Use of organic assets for medevac prohibited w/or sqdn approval.

5. COMMAND AND SIGNAL
   a. Signal. CEOI Index 1-13 in effect.
   b. Command. CP loc PV390582; move on O.

Acknowledge.

GROSS
LTC

OFFICIAL:

/s/Chiaramonte
CHIARAMONTE
S3

Annexes: None.

Distribution: A plus
4 corps (FRG)
2 US Corps

emplacements, mine fields, field hospitals, division headquarters, etc.). Also, map overlays annotated with specific information (intelligence overlay, hazards to flight overlay, etc.) will be available.

Another important item to obtain is the intelligence summary (INTSUM). The INTSUM is published daily, and contains information about the enemy; information about friendly forces usually is not included in this summary. The operations officer may or may not have already extracted the necessary supplemental information pertinent to your mission. Don't forget another extremely valuable source of information about the enemy: talk to other pilots who have flown similar missions.

An essential milestone in the premission planning process is the operations/intelligence briefing. This briefing is conducted by the operations officer or his designated representative and is important for further planning. Information to be sought from this briefing is of two types:

--*Threat information.* Threat information should be kept available that is specifically applicable to the unit area of operations. The data should include types of weapons; air defense weapons and missiles; effective detection; acquisition, and lock-on ranges; a record of "shot-at" reports; and other pertinent threat information that may affect the mission. The accuracy and currency of threat information is absolutely critical to maximize the

probability of mission success and to minimize the risk of hostile interference. The threat situation directly affects all other mission planning steps.

--*Friendly force information*. The location, identification, and posture of friendly supporting/supported units is essential information upon which enroute planning depends.

Your analysis of the basic requirements of the mission will help you to identify gaps in the details and/or currency of your information. Your acquisition of supplemental/update information should be designed to eliminate these gaps. The following discussion addresses some of the gaps that you will find.

A. INTELLIGENCE*

• ENEMY FORCES.* Paragraph 1a of the OPORD contains information about the enemy that is likely to affect accomplishment of the mission. The factual information contained in this subparagraph may be supplemented by a published intelligence annex, a periodic intelligence report, or an intelligence summary. In some operations orders, this subparagraph may consist only of such references. The enemy situation may be shown on the operation overlay if it does not detract from the graphic portrayal of the scheme of maneuver. When it is desirable or feasible to include information about the enemy in the OPORD itself, the information is given in the following sequence:

a. Items pertaining to the enemy's disposition, location, movement, morale, and status of supplies.

b. Strength, including number of units by size opposing the friendly force, as well as percentage of full strength of those forces.

c. Enemy capabilities, e.g., what the enemy can do and with what forces.

d. Probable course of action. This estimate is based on the latest enemy activity.

●FRIENDLY FORCES.* Information on friendly forces is found in subparagraph 1b of the *OPORD. Additional information acquired* by pilots, platoon leaders, and section leaders is gathered and can be obtained from the operations officer. This subparagraph will include information of the next higher unit, adjacent units, and units that are not organic, operational control (OPCON), assigned or attached, but have a supporting role that may affect the accomplishment of the mission. Priority work accomplishment for direct support units other than artillery may be included in this subparagraph. Listing of friendly forces is in a definite sequence, as follows:

a. Higher units (minimum, next higher unit)

b. Adjacent units

c. Supporting units (units in Direct Support and General Support).

(1) Following force of next higher command (Reserve).

(2) Artillery units in numerical or alphabetical order (field artillery first, followed by air defense artillery).

(3) Remainder in any order.

• CONDITIONS.* Any unusual or unexpected condition which may be encountered on the battlefield such as electronic warfare (EW) or nuclear, biological or chemical (NBC) contamination will be posted on the operations map. Additional information on jamming and electronic deception can be found in the MIJI (Meaconing, Intrusion, Jamming, and Interference) report. This report may not always be available due to its classification of SECRET or higher.

B. COMMUNICATIONS*

Air-to-ground communication is significantly restricted and sometimes impossible in the terrain flight mode. When operating at terrain flight altitudes, masking between the helicopter and the ground station occurs. As a result, FM, VHF, and UHF radio which require line-of-sight propagation, become unreliable. Although HF radios do not require line-of-sight propagation, they are not always reliable because of variations

in the ground and sky wave. Construction of a terrain profile can help you to pinpoint those locations along the route of flight from which radio communication can best be achieved. By predetermining the locations of these points, prearranged signals can be transmitted as the aircraft passes them. Because communications are seriously limited during terrain flight, detailed planning must be accomplished to insure that your mission can be performed with very little or without any radio communications with the ground station. Visual communication signals which will allow the air mission commander (AMC) to control the flight when radio silence is required must be established and should be a part of the Unit SOP.

•RADIO.* Information pertaining to radio call signs and frequencies normally are presented in paragraph 5 (Command and Signal) of the OPORD. This paragraph may further reference the Communications-Electronics Operating Instructions (CEOI). Further specific guidance on radiotelephone procedures within your unit can usually be found in the Unit SOP.

•VISUAL.* Visual signals and use of pyrotechnics are provided in the CEOI. As with radio, you can find information on the use of visual signals in the Unit SOP.

C. WEATHER*

Weather information is critical to any form of flight. Obtain current weather information from the operations officer.

He is responsible for maintaining up-to-date weather information for the area of operations.

• AT TAKE-OFF.* The accuracy of your weather data at take-off is likely to be high for two reasons: there is more likely to be a trained weather observer at a base location; and you are able to observe the weather conditions for yourself. Wind speed, direction, and horizontal obstructions to visibility are critical among the many weather considerations of interest to you.

• ENROUTE.* Enroute weather data under tactical conditions may be difficult to acquire. Although the operations officer is responsible for acquiring enroute weather information, remember, he may have to depend heavily on forward ground weather reports obtained from untrained observers. In the absence of more formal sources of weather information, division artillery elements may provide forward weather data.

• DESTINATION AND ALTERNATES.* Requirements for VFR flight, landing, and selection of alternates have been excerpted from AR 95-1 and are provided as follows. These minima may not apply in a tactical situation, and certainly not in combat.

VFR Weather Minima (Uncontrolled Airspace)			
Operation	Ceiling	Visibility	
		R/W	F/W
Daylight:			
Over flat terrain	300	1/2 mile	1 mile
Over mountainous terrain	500	1/2 mile	1 mile
Night:			
Over flat terrain	500	1 mile	2 miles
Over mountainous terrain	1000	1 mile	3 miles

3. OBTAIN MATERIALS:*

Maps, aerial photos, and overlays will be provided by the operations officer. It is most important that you not rely on a single source for information if more than one source can be found. As an example, you may find additional/conflicting information on an overlay or aerial photo that was not on the operations map.

A. MAPS*

Use the most current tactical map available as it will contain a military grid reference system and a more accurate display of man-made features. The suitability of a map for navigation is largely dependent upon its age and scale. Map scale selection depends upon the type of mission to be flown. For tactical operations covering a small area, a large-scale map

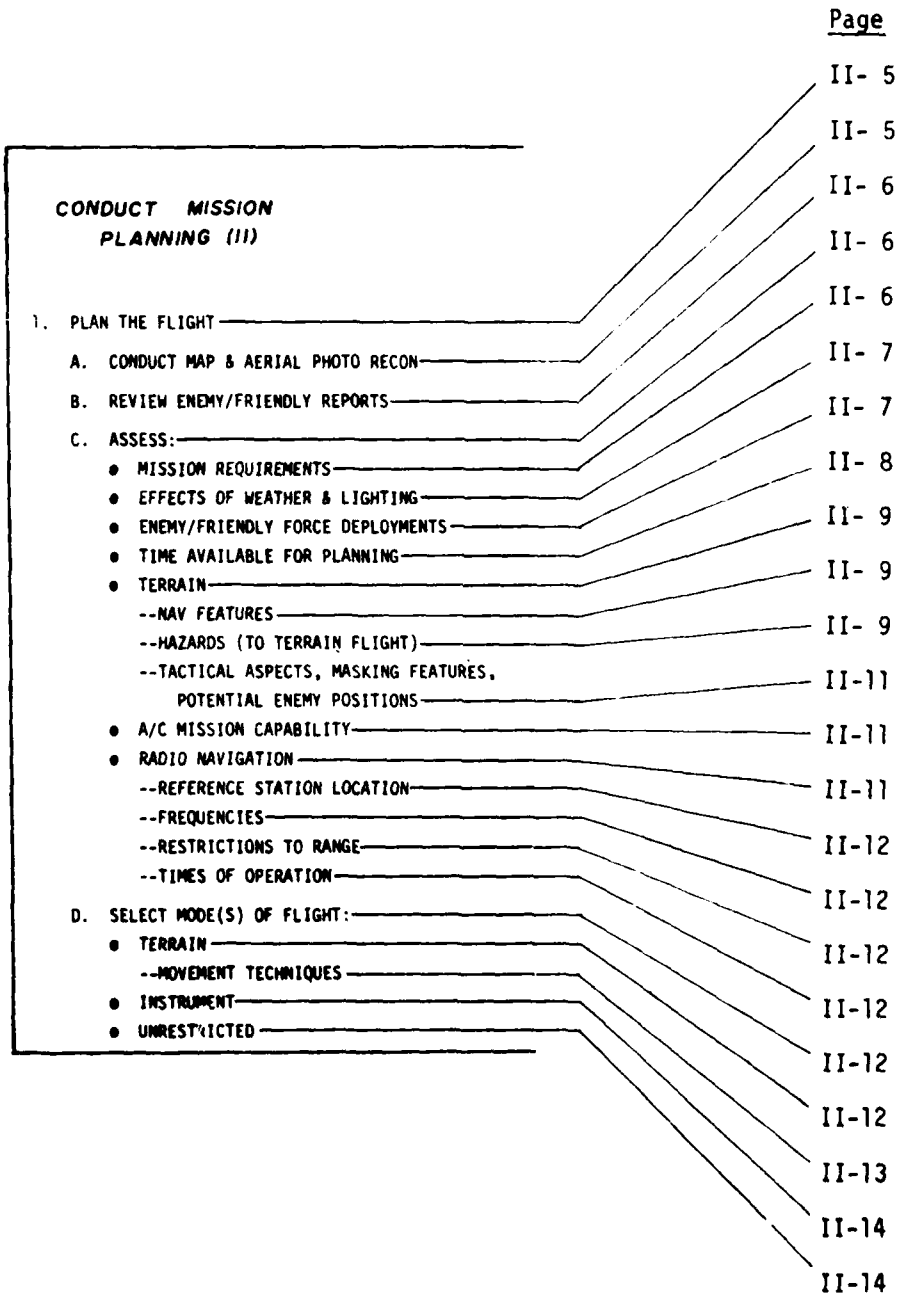
(1:25,000 or 1:50,000) is best because it offers good detail without the penalty of "a cockpit full of maps." On longer administrative or tactical flights, a smaller scale map (1:250,000) may be best. It may be wise to consider using both small- and large-scale maps; small for getting you to the objective area, and large for operating in the objective area.

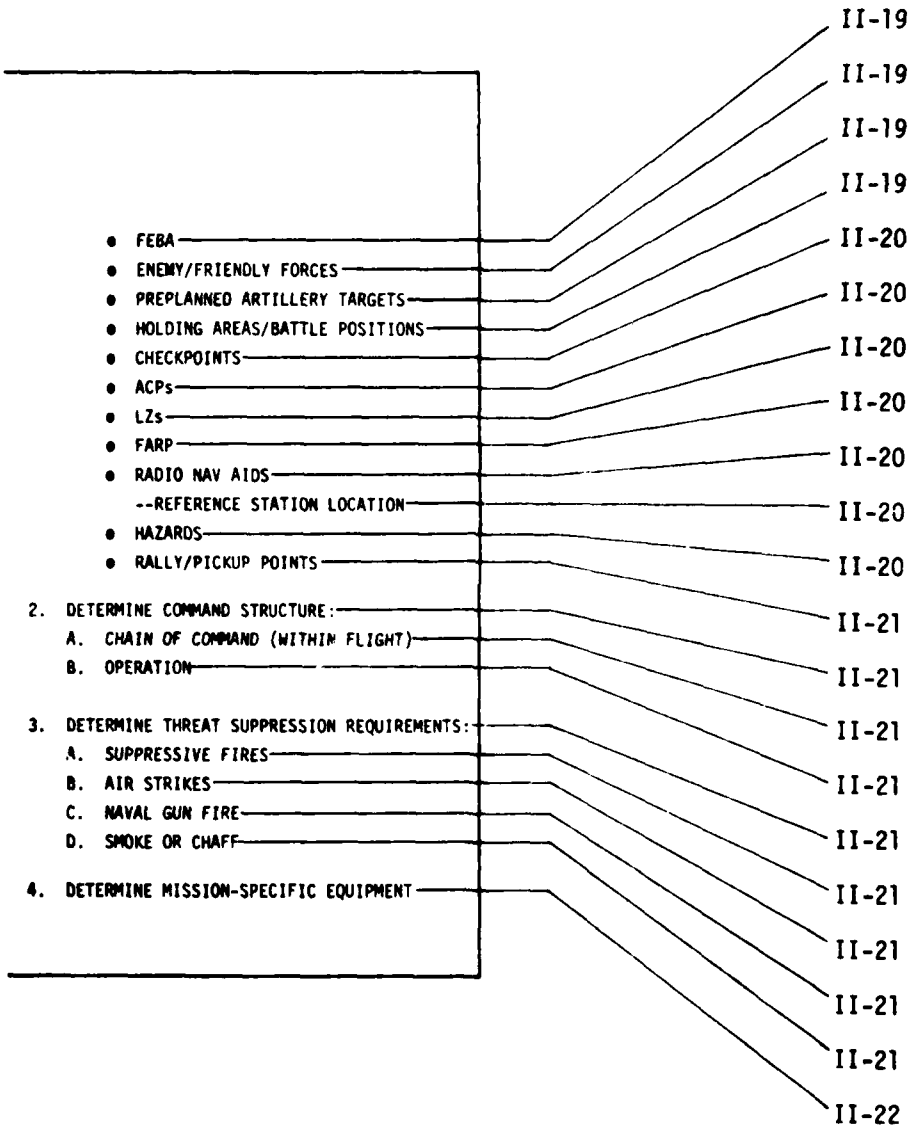
B. AERIAL PHOTOS*

Aerial photos can be particularly useful, especially if they have been taken recently. Examine your proposed route of flight for hazards such as enemy positions or gun emplacements. Check for recent changes that are not indicated on the operations map.

C. OVERLAYS, ETC.*

It would not be possible, as indicated earlier, to depict all pertinent information on the operations map without detracting from the graphic portrayal of the scheme of maneuver. This problem is overcome by the use of overlays. Onionskin or acetate overlays which contain information of a specific nature are available from the operations officer; e.g., engineer, shot-at reports, friendly force boundaries. A common error in transposing overlay information is to misalign the overlay on the map. Take special care that the overlay is aligned with the proper grid reference before transposing.

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CONDUCT MISSION PLANNING (II)*

Army helicopter pilots will henceforth do most of their flying at terrain flight altitudes; either low-level, contour, or nap-of-the-earth (NOE). Terrain flying is the tactic of flying the aircraft in such a manner as to take advantage of the terrain, vegetation, and man-made objects to enhance survivability by degrading the enemy's capability to visually, optically or electronically detect or locate the aircraft. This tactic involves a constant awareness of the capabilities of the enemy weapons and detection means in relation to available masking features of the terrain and flight routes. The type of terrain flying selected (low-level, contour, NOE, or a combination of two or more) will depend on what is required to acceptably diminish the enemy's capability to acquire, track and engage the aircraft.

1. PLAN THE FLIGHT*

Planning the flight is a systematic process by which you seek to learn everything possible about your mission and those factors which may influence its outcome.

A. CONDUCT MAP AND AERIAL PHOTO RECON*

The first step in this process is to examine the map of the area of operations (using the largest scale available). Determine where you are going and what lies between you and your destination, and, based on the general layout of the terrain and its features, determine how many routes are available.

The second step is to conduct a more thorough and detailed map study based on the operations and intelligence briefing and the operations map with pertinent overlays. The landing zones (LZs), air control points (ACPs), and FEBA are plotted, as well as known and suspected enemy positions. Select and carefully study possible flight routes and alternate flight routes to determine their susceptibility to visual or electronic detection by the enemy. Determine altitude restrictions based on enemy threat and mark them on the map. Study the terrain in the immediate vicinity of the selected route to determine the potentially hazardous areas along the route. Identified hazards should be marked on the map. All key terrain features along the route should be noted, especially at or near turning points.

Determine the location and capabilities of the enemy forces present in your area of operations. Their location will directly affect the route and mode of flight selected. Assess the availability of terrain features needed to obtain masking from the enemy. After these items have been accomplished, examine the map again and identify the terrain (streams, valleys, canyons, ridgelines, etc.) which follows the general direction of your route of flight which could be used for this purpose. Plan your general course line to take maximum advantage of the masking and concealment features of this terrain and, thus, maximum avoidance of the enemy.

B. REVIEW ENEMY/FRIENDLY REPORTS*

Review the operations order (paragraphs 1a and 1b), the map overlays, intelligence summary, and spot reports for positions of enemy and friendly forces and the mission of the unit you are to support.

C. ASSESS:*

- MISSION REQUIREMENTS.* The first step in planning for the flight is to analyze the mission and the possible implied missions in order to determine all the requirements that are inherent in them. Knowing if the mission is a single aircraft flight, a multiple aircraft operation, or a multiple sortie mission will affect your planning process significantly. Mission analysis as your first step will insure that subsequent essential

steps are included and that unnecessary steps are omitted.

- EFFECTS OF WEATHER AND LIGHTING.* Weather information is critical for any flight. Wind information is extremely important to flight planning. For this reason, recheck wind conditions at the point of departure, enroute, and at the termination point immediately prior to departure. For planning purposes, use surface winds.

Terrain flight can be conducted successfully in adverse weather if sufficient visibility exists to navigate accurately and avoid obstacles. Maintaining visual reference with the ground is essential when flying in adverse weather at terrain flight altitudes. Avoid flying into the sun whenever possible. As visibility is reduced, reduce airspeed as appropriate.

If night flight is anticipated and the available or forecasted ambient light is insufficient for unaided night flight, plan to use night vision goggles (NVGs). When flying at night, consideration must be given to requirements for cockpit and aircraft lighting. (Refer to the appropriate "preparation for night flight" series Training Circular.) Moon phase and angle, as well as the extent of cloud cover also are important for you to consider.

- ENEMY/FRIENDLY FORCE DEPLOYMENTS.* The complete operations/intelligence briefing that you were given by the

operations officer or his representative is a keystone in the planning process. Assess this information in relation to your mission--

--ENEMY FORCES: Keep available the threat information that is specifically applicable to your area of operations. These data should include types of weapons, types of air defense weapons and missiles, effective detection and acquisition ranges, a record of "shot at" reports, and other pertinent threat information that may affect the mission. Inaccurate information can sometimes be worse than no information. Therefore, it is imperative that threat data be as up to date as possible. *Threat information directly affects all other mission planning steps.*

--FRIENDLY FORCES: Location, identification and posture of friendly/supported forces is essential information on which planning is based. Exercise caution when planning operations in the vicinity of friendly troops, especially during the first two weeks or so of combat. They may not be fully proficient in distinguishing between friendly and enemy aircraft, and the unhappy possibility of being shot down by your own troops should be considered.

• TIME AVAILABLE FOR PLANNING.* At this point in the planning sequence, most of the "critical" steps have been completed. The remaining steps should be accomplished as planning time permits. If you are given an alternate mission in flight,

refer to the Checklist steps up to this point during the initial portions of that alternate mission.

• TERRAIN.* If terrain is not everything to the Army helicopter pilot, it is practically everything. You fly close to it, blend with, and hide behind it. You should learn as much about it as possible. Several aspects of terrain must be considered while planning your flight.

--NAV FEATURES:* A thorough map study prior to a tactical flight can make navigation and other inflight tasks much easier. Obtain knowledge of the terrain throughout the area of operations by becoming familiar with all the major terrain features. This appreciably reduces the amount of time spent referring to the map during flight. Moreover, you will be much better prepared to cope with unexpected changes in the flight by having familiarized yourself with your surroundings.

--HAZARDS (TO TERRAIN FLIGHT):* You must be constantly alert for all hazards to terrain flight. Hazards to terrain flight are classified as physical, weather, and human factors related. Physical hazards are natural or man-made. Natural hazards are birds, trees, etc. Man-made hazards are aircraft, towers, wires, etc. Weather hazards include wind, turbulence, and restrictions to visibility (haze, fog, and precipitation). Restrictions to visibility are aggravated by a low sun. Human factors related hazards include poor physical

condition, emotional stress, limited peripheral vision, fatigue, etc.

An important initial step in hazard avoidance begins at the initial briefing of the mission; check the hazard map for known hazards along the route of flight. Once airborne, it is most important that you "keep your head out of the cockpit." You must use effective scanning techniques, interpret visual cues, and recognize existing blind spots.

Wires are a significant hazard to aircraft when terrain flying because they are difficult to see. The safest way to overfly wires is to cross them at a pole; it is much easier to determine wire height at that point. In combat it may be necessary to underfly wires to prevent exposure to visual and electronic detection. To underfly wires safely, you must estimate accurately the clearance of the wires above the ground.

Terrain flight under conditions of reduced visibility requires careful procedural adjustments. Avoid flying into the sun and reduce airspeed so that you can see physical hazards in time to avoid them. Turbulence and thermals can be extremely dangerous if you are not prepared for them, especially if the aircraft is heavily loaded.

Fatigue is a difficult problem to cope with because it cannot be easily measured and often goes unrecognized. It can

be reduced by minimizing the physical and emotional stresses that produce fatigue. Some of the common stresses are prolonged flight, temperature extremes, colds, poor eating habits, overweight, alcohol and tobacco indulgence, and personal problems. Common signs of fatigue include deterioration in aviator performance and judgment, poor coordination, daydreaming, object fixation, and slowed reaction time.

--TACTICAL ASPECTS, MASKING FEATURES, POTENTIAL ENEMY POSITIONS:* The overall objective is to keep the terrain between you and the enemy. If the enemy can't see you, he can't shoot you down. The time required to detect, track, and lock on varies with different threat weapons systems. As a general rule, you should not routinely remain unmasked for longer than 10 seconds.

You may query the intelligence officer as to what he thinks the enemy is going to do. This helps you to assess the type and intensity of the enemy threat. It also helps determine how much masking is required for your mission.

• AIRCRAFT MISSION CAPABILITY.* A quick review of a few items will help you decide, in general terms, whether your aircraft is capable of performing the mission: pertinent weather conditions, to include density altitude; number of troops or size, weight and type of cargo; special equipment requirements.

• RADIO NAVIGATION.* When conducting terrain flight, radio navigation will often be limited because line of sight

propagation between transmitter and receiver is not possible. During this phase of the planning, determine and coordinate your requirements for navigational aids with those NAVAIDS available to you for use. A detailed map study will allow you to plan the use of navigational aids to insure reliable reception distances or plan for "dead spots" when you will dead-reckon navigate until a reliable signal is intercepted. It may be necessary to reroute or modify the plan based on the navigational aids that can be used.

REFERENCE STATION LOCATIONS* must be checked and plotted; do not assume they will be in the same place they were the last time you were out. FREQUENCIES,* RESTRICTIONS TO RANGE,* and TIMES OF OPERATION* must be double checked as they also may have changed.

D. SELECT MODE(S) OF FLIGHT:*

• TERRAIN.* Four factors influence your decision whether to fly the mission using low-level, contour, nap-of-the-earth (NOE), or a combination of these techniques. First, the threat and the availability of masking terrain will dictate which technique to use in a given situation by imposing maximum altitude restrictions. Second, time considerations (mission urgency) influence the selection of a flight mode. When masking is available, contour or low-level flight usually is preferable to NOE because more sorties can be flown or greater distances covered due to the higher airspeeds of low-level and contour flight. The

third consideration is safety. The higher the altitude, the greater the reaction time in an emergency and the higher the probability of obstacle and hazard avoidance. For these reasons, the highest altitude below masking terrain should be used. The fourth consideration is weather. A lower altitude than dictated by the threat may be necessary because reduced visibility forces you lower in order to maintain visual contact with the ground.

Terrain flight navigation is difficult because the flat visual angle distorts shape compared to the map and because vertical relief is the most suitable means of identifying checkpoints. This requires proficiency in map reading, terrain interpretation, and terrain/map correlation. The navigational difficulty is greatest at NOE because you navigate primarily by vertical relief which must be interpreted from the map.

--MOVEMENT TECHNIQUES:* Base your selection of a movement technique on the likelihood of enemy contact. If enemy contact is not expected, and availability of masking terrain permits, traveling may be the movement technique chosen. In traveling, the flight moves at constant speed, using low-level or contour flight. Traveling overwatch is used when enemy contact is possible. Lead and trail aircraft are designated, and the lead aircraft moves continually. The trail aircraft prepares to maneuver or provide suppressive fire for the lead aircraft as necessary. Bounding overwatch is the recommended movement technique if enemy contact is expected. Overwatch aircraft cover the

progress of bounding aircraft from a covered and concealed overwatch position. The length of each bound is closely tied to terrain, visibility, and the range of the overwatch aircraft's weapons.

- INSTRUMENT.* Tactical instrument flight will be planned and conducted in accordance with governing regulations.

- UNRESTRICTED.* The mode of flight selected here is not based on any threat (any mode can be used), and the mode selected will be per the Unit SOP.

E. SELECT ROUTES:*

The first consideration in route planning is to know the local enemy threat. Then, plan the routes to keep the highest possible terrain or the thickest vegetation (mass) between the aircraft and the enemy. Avoid using man-made objects as checkpoints because they are subject to change. Routes should not follow man-made linear features such as roads, canals or pipelines unless required because of reduced visibility. Avoid silhouetting the aircraft when crossing ridgelines; cross at the lowest point on the ridgeline. Avoid open areas if terrain permits. Plan routes along stream beds or over vegetation if possible. Plan primary and alternate routes. Altitude restrictions should be determined for each route. Routes should be planned for the greatest masking opportunity available.

After review and careful consideration of all the critical factors, i.e., threat, MIJI, terrain, mass, etc., select the main route of flight. In choosing alternate routes, the same criteria should be used as for selecting the main route.

F. COMPUTE/DETERMINE: *

- TIME OF FLIGHT/DISTANCE.* Many of the techniques that you use for NOE and contour navigation are applicable for low-level navigation. However, some techniques can be used for low-level navigation that cannot be used for contour or NOE navigation. For example, since low-level flight is characterized by constant airspeed, computed time-distance can be used effectively for low-level navigation. You also can use FM homing and tactical ADF homing effectively as navigation aids. Refer to FM 1-5 for more details on navigation when terrain flying. By estimating airspeed in advance, you will be able to roughly determine your ETA at the destination. If a specific time of arrival is desired, you can compute the required takeoff time.

- EXPECTED AIRSPEEDS/ALTITUDES.* Base your estimated airspeed on the type of terrain flight employed, which is determined largely by four factors: mission, enemy, terrain, and weather. Estimate flight altitudes by analyzing terrain, obstacles, and the air defense threat. Map analysis is your primary source for determining a flight altitude that provides obstacle clearance along the selected route.

• FUEL REQUIREMENTS.* Fuel requirements must be established during this phase of the flight planning. Map study, coupled with wind information, provides an early indication of fuel requirements so that you can plan routes and fuel stops as necessary. Time-distance computations to assist in navigation can be accomplished as a result of the map study.

• ARMAMENT REQUIREMENTS.* The type of armament required depends on the type of mission, and helicopter armament is usually standard for each type unit. However, if special armament is required for your mission, this is the time to make note of it.

G. COORDINATE FIRE SUPPORT:*

• PREPLANNED TARGETS.* It is important to determine the locations along your route where the enemy may be located, even if these positions are not stated elsewhere in premission information. Pick the positions where the enemy potentially could do the most damage to your operation (if he <u>were</u> located at these positions) and preplan artillery targets. This provides you two options. As you approach a likely enemy position, you can call artillery to that specific target, reducing the enemy's capability to fire at you; or, if you receive fire from that position, you can direct fire to that preplanned target number. Either of these options is faster and more effective than calling in artillery to an unplanned position after you start receiving fire.

• ARTILLERY AIR CORRIDORS.* Determine the location of artillery air corridors along your route. Be sure to annotate the times of operation and the types of artillery being used in that corridor. Also, be sure to determine the priority of fire in each corridor. Usually this will be coded: red means they will fire on all aircraft; yellow means they are to fire only at positively identified aircraft; green indicates they are not to fire at any aircraft.

• SUPPORTING UNITS.* Be sure to check the priority of fires for the artillery unit which will support your mission. If you have a low priority, artillery support may not be available to you.

H. ANNOTATE MAP OR OVERLAY:*

Your map(s) and overlays may be annotated with a great deal of navigational and operational information, many of which are noted below. Other bits of information of your choosing may also be annotated. Your unit may, for security reasons, prohibit map or overlay annotation of some items listed below. If such is the case, your Unit SOP would take precedence.

• ROUTES.* The difficulty and criticality of navigating accurately at terrain flight altitudes requires careful annotation of maps and overlays. Plot COURSE LINE* with MILEAGE TIC MARKS* and MAGNETIC MARKINGS.* Then plot BOUNDARIES* and FLIGHT CORRIDORS.* Another important assist is to mark CRITICAL TURNS

WITH MAGNETIC HEADING* indicated. ELEVATION OF KEY POINTS* along the route also is an excellent reference.

Certain aspects of terrain flight differ depending on whether low-level, contour, or NOE flight is being performed. Terrain flying normally will involve a combination of these flight techniques during any given flight. You must be familiar with the navigational techniques of all three.

NOE navigation requires continuous orientation, unlike contour and low-level navigation wherein you follow the desired route by identifying a series of checkpoints. To remain continuously oriented, the crewmember navigating must identify all terrain features depicted along his route on the map with the actual terrain feature. This requires that he be highly proficient in map/terrain correlation and that the navigator and the pilot work together as a team. When possible, the pilot should be told to follow an identifiable terrain feature such as a stream bed, draw, or spur. Guidance information should be provided in small increments, generally not beyond the next turning point. Several terrain features and common terminology should be used to identify a turning point to prevent confusion.

NOE navigation requires the precise following of a predetermined course that makes best use of available terrain features for maximum masking effects. However, certain missions, i.e., screens, require flight paths to be selected as the flight progresses.

Since the contour route is planned to utilize the terrain to achieve cover and concealment, it must be followed closely. Due to the generally high airspeeds which characterize contour flight, space checkpoints on the route according to the planned airspeed to be flown and be sure they are easily identifiable.

- PHASE LINES.* Phase lines are an important means of control both for ground and air cavalry units. Phase lines normally follow a feature or features easily recognizable at night or through the smoke or haze of battle. Annotating phase lines will help you keep track of the progress of battle.

- FEBA.* The FEBA (forward edge of the battle area) is subject to continuous change, yet, its location is essential information and should be plotted on your map or overlay.

- ENEMY/FRIENDLY FORCES.* At a minimum, the locations of those friendly forces which you are to support or be supported by should be plotted. Locations of enemy forces which may affect your mission or which are opposing friendly supporting/supported forces also should be plotted.

- PREPLANNED ARTILLERY TARGETS.* Annotate those preplanned artillery targets closest to your route of flight.

- HOLDING AREAS/BATTLE POSITIONS.* Possible holding areas and battle positions which, based on your map study, appear

to be suitable for the purposes of your mission should be so annotated on your map or overlay.

- CHECKPOINTS.* Annotation of checkpoints is useful for a variety of reasons. They may be used for purposes of navigation, reminders to take specific action, contact other units, etc. Your annotation should indicate the purpose of the checkpoint and/or the action required.

- ACPs.* Air control points, like boundaries and flight corridors, are effective in controlling aircraft movement both in training and on tactical missions. If required for your mission, they should be plotted.

- LZs.* The locations of any landing zones (primary or alternates) must be plotted.

- FARP.* FARP locations should be plotted for your area of operations whether or not you intend to use them; your mission may take longer than expected.

- RADIO AIDS.* All radio navigation aids and REFERENCE STATION LOCATIONS* in your area of operations should be plotted, especially those near your planned route, in case of inadvertent IMC. Also note the times of operation, frequencies, and any other information that you will need to use the NAVAIDS.

- HAZARDS.* Physical hazards to terrain flight, both natural and man-made, should be plotted.

• RALLY/PICKUP POINTS.* Rally/pickup points are located at various points in each area of operations for pickup of downed aircraft crews. These locattons should be plotted.

2. DETERMINE COMMAND STRUCTURE:*

A. CHAIN OF COMMAND (WITHIN FLIGHT).*

The flight chain of command should be understood by all aircrews so that the flight will always have direction no matter how many aircraft are lost.

B. OPERATION.*

The ground commander has overall authority and command on the battlefield, including the direction (command) of aircraft in his area of operations. All Army aircraft (and for that matter, all Air Force aircraft) activities are geared to supporting the ground commander and his efforts.

3. DETERMINE THREAT SUPPRESSION REQUIREMENTS:*

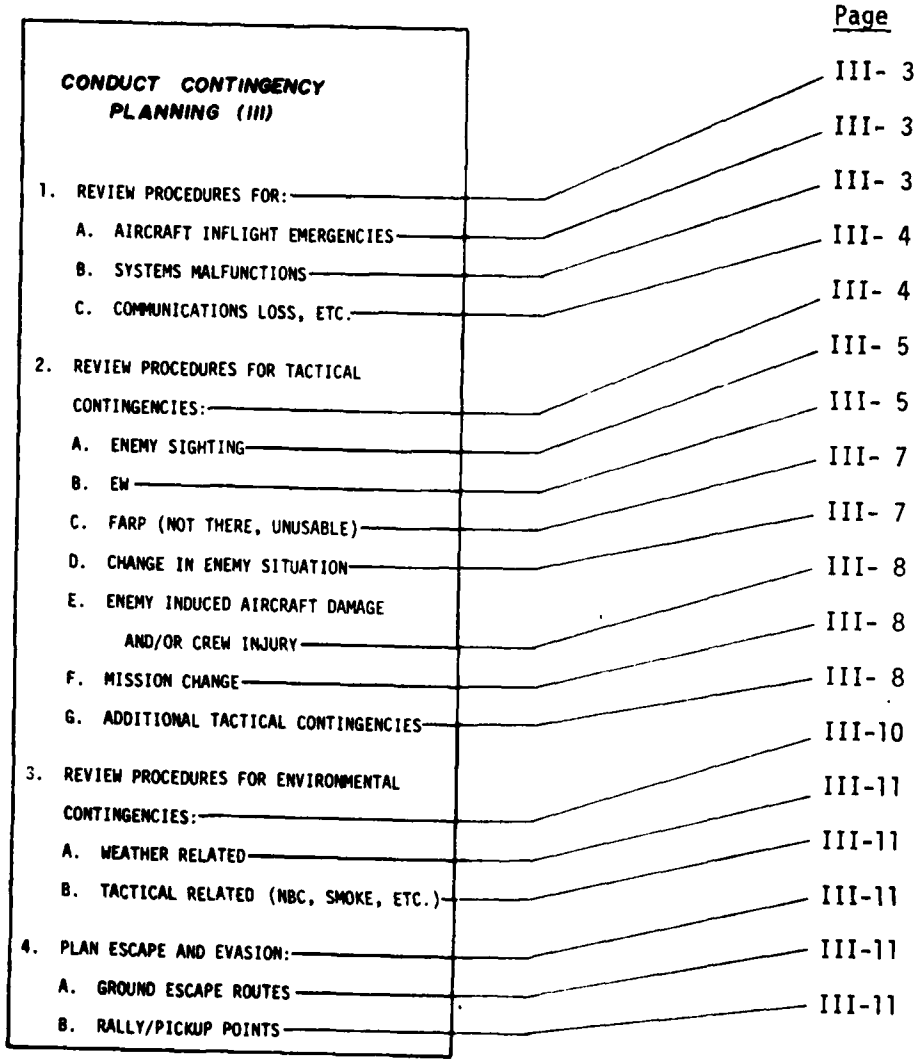
When planning a flight using terrain flight techniques, you are actually planning avoidance. When using NOE flight, there will be times when detection must be expected. Therefore, mission planning should provide for SUPPRESSIVE FIRES* (AIR STRIKES,* attack helicopters, artillery, tactical air support, and NAVAL GUN FIRE*), SMOKE OR CHAFF,* or any other means available which can prevent the enemy from locating and/or attacking the aircraft.

Again, pay special attention to the priority and availability of suppressive fires. If you have a low priority, suppressive fires may not be available to you.

4. DETERMINE MISSION-SPECIFIC EQUIPMENT*

This step is done mainly as a double check. Normally, the operations officer will insure that your aircraft is equipped with the necessary special equipment required for your mission. Frequently, the ground personnel you are supporting will provide the mission-specific equipment for you when you pick up the ground troops associated with that particular mission.

Mission-specific equipment can be broken down into two categories: essential and nice to have. In most cases, the essential equipment (mine dispensers, protective masks, etc.) will be provided for you. Nice to have equipment (water wings, arctic survival kit, etc.) may be up to you to obtain.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CONDUCT CONTINGENCY PLANNING (III)*

The word contingency is described as (1) an event which may occur but is not likely or intended; (2) a future possibility which must be prepared against. Inasmuch as the pilot cannot expect each mission to be exactly the same as the one before, planning for the unexpected becomes as critical as planning for those scheduled events necessary for mission accomplishment. Even though a contingency is unexpected, if a plan is made to deal with it, its occurrence is less likely to surprise the pilot to the point of critical, perhaps fatal, indecision or inaction.

Any one or several of a great many things can happen on a combat mission which can interfere with or preclude accomplishment of that mission. The likelihood of a specific event occurring is dependent on a great many factors. These factors include, but are not limited to, the type of mission, the nature of the enemy threat, and the type of terrain in the area of operations.

This section further explains and defines four categories of contingencies listed in the Premission Planning Checklist. As indicated above, the decision as to whether formal planning is conducted for each contingency item listed is dependent on need as dictated by the type of mission and other factors.

1. REVIEW PROCEDURES FOR:*

A. AIRCRAFT INFLIGHT EMERGENCIES*

Emergency procedures are contained in the "dash 10" for each aircraft. However, many of these procedures are not designed for use during NOE flight. At NOE flight altitudes and airspeeds, the aircraft is operating outside the flight envelope required to perform some of the emergency procedures successfully as described. For example, there are a number of malfunctions which would cause a loss of engine RPM. Under normal conditions of flight, you may have time to analyze the cause of the RPM loss before taking action. However, at NOE altitude, you may well be in the trees or on the ground before you get halfway through the analysis. For planning purposes, therefore, modification of the "dash 10" emergency procedures should be considered. If such modifications are not published in the Unit SOP, a good plan would be to treat all malfunctions resulting in engine RPM loss as an actual engine failure, and to proceed accordingly.

B. SYSTEMS MALFUNCTIONS*

Most of the procedures that apply to the affected systems, whether it is battle inflicted or a maintenance malfunction, are covered in the Unit SOP. The decision to continue the flight depends on the nature of the malfunction, your mission requirements, the proximity of enemy forces, and the extent to which the malfunction affects the successful accomplishment of your mission.

When contingency planning, you should be aware of increased maintenance problems associated with terrain flight. The higher power settings required for NOE flight impose a burdensome strain on engines, rotor blades and transmissions. Incidence of blade strike will increase and skin punctures will be more common, necessitating more timely and complete maintenance inspection.

C. COMMUNICATIONS LOSS, ETC.*

Loss of communications can occur at any time. Lost commo procedures should be detailed in the Unit SOP (e.g., procedures for relay of spot reports without the use of radios). Prebrief procedures--hand signals, etc.--for contingency plans should the aircraft intercommunication (intercom) system become inoperative. Procedures for use of visual aircraft signals are in the CEOI.

The multiple jamming capabilities of our potential adversaries may force us to fly entire operations in the future without the use of radios at all. This will require extensive premission planning and coordination. Details as to procedures and methods of control also should be found in the Unit SOP.

2. REVIEW PROCEDURES FOR TACTICAL CONTINGENCIES.*

The procedures for accomplishing planning for tactical contingencies are generally included in the Unit SOP. The urgency of the mission and the amount of time available to plan for the mission will dictate the amount of time spent planning and briefing each area.

A. ENEMY SIGHTING*

Enemy information is extremely important and should be reported without delay. Accuracy and completeness of information is best assured by using the standard format for delivery of a spot report for enemy information. The type of information and sequence is:

SPOT REPORT FOR ENEMY INFORMATION	
ALPHA:	Who is observer or source?
BRAVO:	What? How many? How equipped?
CHARLIE:	Where and when?
DELTA:	Doing what? (if moving, give direction, speed and altitude).
ECHO:	What are you doing?

B. ELECTRONIC WARFARE*

You can expect the threat to use electronic jamming as a means to disrupt, confuse, or deny your use of communications systems. Contingency plans must be made to deal with it when it happens.

The first thing that must be remembered is that not all radio interference is caused by jamming (e.g., atmospheric disturbances). Refer to FM 1-2, Aircraft Battlefield Countermeasures and Survivability, for additional examples of non-intentional jamming. Your EW planning should include ways to minimize or prevent jamming

in the first place. They include but are not limited to:

Mask Antennas: This will preclude the enemy from receiving signals to spot jam and will protect the antenna from barrage or sweep jamming.

Use Communications Equipment Only When Necessary: Use radios, beacons, navigational aids, and electronic equipment only as needed. If not needed, turn them off.

Limit Transmission Time: Use brevity lists and abbreviated call signs. Know what you want to say before keying the transmitter.

Use Low Power if Possible: This may prevent the enemy from receiving signals to spot jam.

Rely on Alternate Means of Communications When Feasible: The more you train using alternate means of communications, the less dependent you will be on radios.

Use Directional Antenna Modifications When Feasible: This will limit the enemy's reception capabilities and strengthen your communications.

If, in spite of your precautions, you determine that you are being jammed, counter-countermeasures should be taken to render the jamming ineffective. Some recommended steps include:

Keep Operating: Never say anything that admits that you are being jammed. That would only assure the enemy that his jamming is effective. Try to work through the jamming. Repeat transmission and use "say again" as necessary. If jamming is a sweep type, you may be able to transmit briefly during lulls of jamming intensity.

Mask Your Antenna: If it can be determined from which direction the jamming is likely to be coming, position yourself so that a natural obstacle is located between you and the enemy jammer.

Retune Your Radio: Try tuning the radio a few kilohertz above or below the operating frequency to see if that will decrease the intensity of the jamming signal, and continue to operate.

Switch to High Power: If operating in low power mode, switch to high power in an attempt to override the jamming signal.

Use Alternate Means of Communications: Switch to another type of radio if possible. Use CEOI brevity lists for switch code. Use hand and arm, placard, aircraft position, or smoke signals per Unit SOP if possible. Good premission planning will eliminate many communication requirements.

Use Relay Stations: Use relay stations to work through jamming if possible.

Change to an Alternate Frequency: After all else has failed, short of messenger service, change to an alternate frequency. This procedure should be used on an emergency basis only, and authentication is required. Frequency change is designated by the brevity code.

C. FARP (NOT THERE, UNUSABLE)*

The Unit SOP will provide guidance on use of the FARP (Forward Arming and Refueling Point). If the FARP is found destroyed, not there, or unusable, proceed as prescribed in the Unit SOP.

D. CHANGE IN ENEMY SITUATION*

Change in the enemy situation should be considered a certainty rather than a possibility. The only real question is how much change has taken place since the latest intelligence update. A change in the enemy situation which affects your mission can be so varied in nature that every contingency could not possibly be listed here or in the Unit SOP. An example may be that your destination LZ is hot when it was expected to be cold. What do you do? Has an alternate LZ or course of action been planned?

Examples of this type may be found in the Unit SOP, or your mission commander may have the information.

E. ENEMY INDUCED AIRCRAFT DAMAGE AND/OR CREW INJURY*

Again, such a contingency should be discussed in the Unit SOP. Your action will necessarily depend on internal and external factors such as seriousness of crew injury or aircraft damage, criticality of the mission, terrain, and the enemy situation. In case of aircraft damage, you should land and inspect the aircraft if, and when, time and conditions permit.

F. MISSION CHANGE*

Mission changes will come through the mission commander in multiple aircraft sorties, so your briefing would be provided by him. On single aircraft missions, you also must be prepared to accept a change in mission and be ready to perform it. This contingency requires a thorough knowledge of the area of operations (especially locations of friendly units) and sufficient maps to cover the area. Authentication using the CEOI is required for mission changes. The Unit SOP should contain further information on inflight mission change procedures.

G. ADDITIONAL TACTICAL CONTINGENCIES*

This includes anything else that can happen to you on the battlefield. As indicated earlier, the possibilities are so numerous as to preclude discussion here. Planning for these

tactical contingencies should depend largely on the current situation in the area in which your mission is to be flown. If enemy air activity is heavy or expected in your area, plan your route so as to avoid detection from the air. Fly in the shadows as much as possible to avoid casting a detectable shadow; don't fly in a straight line for long stretches; avoid flat open areas. Review engagement avoidance procedures for:

a. *High Performance Aircraft.* The key to avoiding an attack by fighter aircraft is knowing when to initiate evasive action. Wait until the fighter has initiated his attack dive before beginning evasive action. After the attack dive is initiated, turn and fly directly toward the fighter, and dive if altitude permits. This forces the fighter to steepen his dive angle continuously, forcing a breakoff or inability to recover from the dive. The fighter probably will not begin engagement with cannon prior to reaching 3,000 feet AGL. A few seconds before the fighter reaches that estimated altitude, make a rapid 90^{o} turn in either direction. The fighter will be unable to engage you effectively. Once the attack is broken, maneuver your helicopter to take advantage of terrain offering concealment.

b. *Small Arms.* Immediately turn away from the fire toward an area of concealment. If concealment is

not available, sharp turns of unequal magnitude at unequal time intervals will provide the best protection until the helicopter is beyond the effective range of the hostile weapons. If the situation permits, employ immediate suppressive fires.

c. *Large Caliber Antiaircraft Fire (radar controlled 37mm and 57mm).* Execute an immediate 90^{o} turn. This turn will move the helicopter away from the burst. After the initial turn, do not maintain straight-line flight for more than ten seconds before a second 90^{o} turn is initiated. Through all turns and straight-line flight, an immediate descent to low level or NOE altitude will reduce the danger.

d. *Heat Seeking Missile.* Mask the helicopter behind a terrain feature. By far, the most effective countermeasure for this type of threat is to make all approaches and attacks from the direction of the sun. Whenever practical, flights should be made as close to the earth as terrain and obstacles permit.

3. REVIEW PROCEDURES FOR ENVIRONMENTAL CONTINGENCIES;*

A. WEATHER RELATED*

Read and heed the latest weather reports for the area of operations. Know *exactly* the location of navigational aids. Vertical helicopter IFR recovery procedures (formerly known as inadvertent IMC) and other weather related contingencies will differ with each aviation unit. Consult your Unit SOP for specific weather contingency instructions.

B. TACTICAL RELATED (NBC, SMOKE, ETC.)*

The Unit SOP will specify conditions under which protective masks and protective clothing will be required at takeoff.

4. PLAN ESCAPE AND EVASION:*

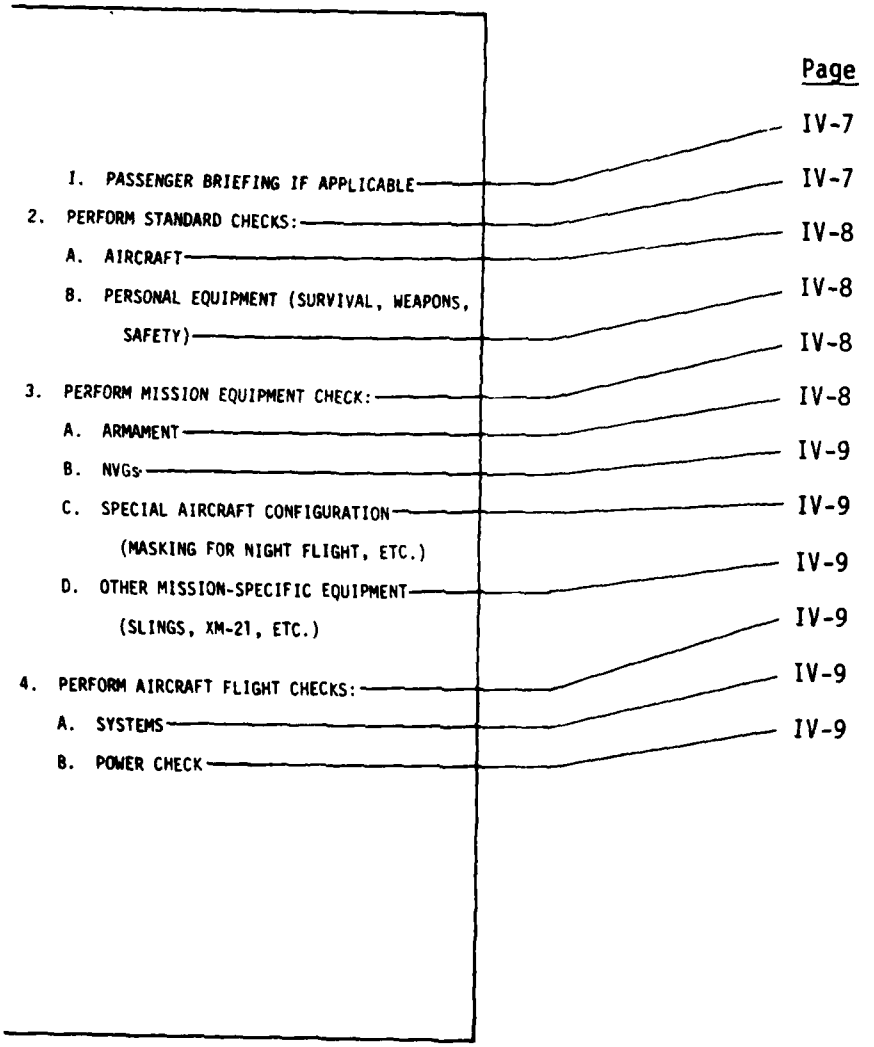
A. GROUND ESCAPE ROUTES*

Units normally designate escape routes for formations, while individual flights normally do their own route planning. Consult FM 21-76, Survival Evasion and Escape, and the Unit SOP for more information.

B. RALLY/PICKUP POINTS*

Downed aircraft crew rally/pickup points are designated throughout the area of operations. Annotate or otherwise record those locations nearest your intended route of flight.

CONDUCT CREW BRIEFING AND PREMISSION CHECKS (IV)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4. PERFORM AIRCRAFT FLIGHT CHECKS:
IV-9
A. SYSTEMS
IV-9
B. POWER CHECK
IV-9

CONDUCT CREW BRIEFING AND PREMISSION CHECKS (IV)*

A vital and often overlooked part of Premission Planning is the crew briefing. Mission success depends upon the coordinated efforts of every member of the crew. It stands to reason that appropriate action at the appropriate time cannot be expected from a crew which has not been briefed or which has been insufficiently briefed. Remember, non-pilot crewmembers are not passengers!

1. BRIEF CREW:*

Since the entire crew must act as a coordinated team during the mission, their briefing must be thorough. In fact, the crew should be familiar with all aspects of the mission and what is expected of them just as does the pilot.

A. MISSION*

The entire crew should have a thorough understanding of what the mission is, and each member should understand his role in accomplishing the mission.

B. SITUATION*

•ENEMY/FRIENDLY.* Inform the crew of the enemy/friendly situations inasmuch as they affect or impact upon your mission; e.g., are troops in heavy contact; is the situation stable; is it rapidly changing?

•WEATHER/TERRAIN.* If weather conditions are such that a departure from routine procedures may become necessary, inform the crew. The type of terrain over which flight is to be conducted may dictate the extent of crew involvement in obstacle avoidance, so they should be generally aware of the type terrain to expect.

• CONDITIONS (EW, NBC).* Make crewmembers who will transmit or receive communications outside the aircraft aware of the EW

threat. All crewmembers definitely should be aware of the NBC threat in the area of operations.

C. PLAN OF OPERATION*

• FLIGHT PLAN.* Inform crewmembers where they are going and how to get there.

• FIRE SUPPORT PLAN.* Any crewmember who may be involved in requesting or adjusting fire support should be thoroughly knowledgeable of the fire support plan. This will include preplanned target information, supporting artillery units, naval gunfire, and TAC air.

• SCHEDULE/COORDINATION.* Explain schedule for mission completion and/or critical events scheduled to take place during the mission. Also, discuss intracrew coordination plans or coordination to be effected with other units.

• CONTINGENCY PLAN.* Brief thoroughly any contingency which involves crew participation, e.g., system malfunction, enemy fire, enemy sighting, enemy air attack.

D. COMMUNICATION*

• RADIO.* Use of radios will be dictated in part by the EW threat; brief the crew accordingly. They should be aware of frequencies, times of operation, etc.

• VISUAL.* Visual communications will be used per the CEOI. Your crew briefing should include when they will be used and, to the extent deemed necessary, a review of the procedures themselves.

E. COMMAND STRUCTURE*

Each crewmember should know the command structure or line of authority within the flight in which he is involved.

F. PERSONAL EQUIPMENT REQUIREMENTS*

As a double check, routine (e.g., survival vests), as well as special equipment (e.g., protective masks) requirements should be covered.

G. *CREW/TEAM DUTIES/RESPONSIBILITIES**

• PREFLIGHT.* Assure that each crewmember has accomplished his normal preflight duties, and brief on special duties, if any, for each crewmember.

• FLIGHT.* Be sure each crewmember thoroughly understands all his duties and responsibilities for your mission; e.g., one crewmember may be assigned the task of scanning the terrain for enemy activity, and another assigned to scan for enemy air attacks.

• CONTINGENCY/EMERGENCY.* Explain each crewmember's personal responsibilities in the event of any planned contingency.

H. SUPPORT*

- POL.* Stress proper refueling procedures (IAW the Unit SOP).

- ARMAMENT.* Review type armament required.

- RATIONS.* Brief how many rations, if any, are needed for the mission.

- RELIEF.* Indicate what units will relieve you on the line and when relief can be expected. Also, specify coordinating instructions for how relief is to be effected.

- MAINTENANCE/RECOVERY.* Point out who will provide maintenance support or aircraft recovery, if needed.

- MEDEVAC.* Specify who will provide medevac support.

I. PASSENGER BRIEFING IF APPLICABLE*

If passengers are to be transported, brief them on procedures while in or around the aircraft.

2. PERFORM STANDARD CHECKS:*

Few pieces of military equipment are more complicated and yet subjected to such hard operational use as the helicopter. Fewer still are more dangerous if a malfunction occurs in operation. Your helicopter is your lifeline, and it requires diligence on your part to insure its reliability.

Standard checks for your helicopter are in the appropriate "dash 10", but also consider any special problems inherent in your unit's operations. If your unit flies extensively at NOE altitudes, check carefully for blade damage or skin punctures. If flying in heavy dust and sand, bearings and engine parts may wear out sooner. If in doubt, ask the maintenance officer or other expert about any questionable item on the standard checks.

A. AIRCRAFT*

Check your aircraft as prescribed in the "dash 10" to include: weight and balance, airframe, systems, POL, and on-board equipment.

B. PERSONAL EQUIPMENT (SURVIVAL, WEAPONS, SAFETY)*

Your checks should include, but not be limited to: survival vest, armored vest, and personal weapon.

3. PERFORM MISSION EQUIPMENT CHECKS:*

Those items of equipment essential for accomplishment of your mission must be checked for proper operation. If you depart on your mission without making those checks, you may add nothing to your unit's effort except provide the enemy another target.

A. ARMAMENT*

Make operational checks.

B. NVGs*

Make operational checks.

C. SPECIAL AIRCRAFT CONFIGURATION (MASKING FOR NIGHT FLIGHT, ETC.)*

If night mission, prepare aircraft in accordance with the appropriate "preparation for night flight" series training circular.

D. MISSION-SPECIFIC EQUIPMENT (SLINGS, XM-21, etc.)*

Mission-specific equipment should be checked for availability and serviceability.

4. PERFORM AIRCRAFT FLIGHT CHECKS:*

If your helicopter is sick, you will most likely find out while performing the aircraft flight checks. Resist the temptation to rush at this point. Be deliberate. If you do *anything* by the book, it should be the aircraft flight checks.

A. SYSTEMS*

Check systems during run-up as prescribed in "dash 10."

B. POWER CHECK*

Perform power checks as required.

PREMISSION PLANNING CHECK SHEET

	NA	YES	NO
ROUTE PLANNING			
1. ROUTE GENERALLY FOLLOWS TERRAIN FEATURES			
2. CHECKPOINTS PLOTTED ON MAP ARE LANDMARKS			
3. ROUTE AVOIDS LARGE OPEN AREAS AND BODIES OF WATER			
4. MODES OF TERRAIN FLIGHT CONSIDERED			
5. ROUTE AVOIDS KNOWN ENEMY ADA			
6. ALTERNATE AND RETURN ROUTES CONSIDERED			
MAP ANNOTATION			
1. FEBA PLOTTED			
2. ENEMY FORCES (ESPECIALLY ADA) PLOTTED			
3. NAVAIDS NEAR ROUTE PLOTTED			
4. HAZARDS TO TERRAIN FLIGHT PLOTTED			
5. PREPLANNED ARTILLERY TARGETS PLOTTED			
6. RALLY/PICKUP POINTS PLOTTED			
MISSION COMMUNICATIONS			
KNOW THE NEEDED:			
1. CALL SIGN AND FREQUENCIES			
2. SECURE COMMUNICATION INFORMATION--CEOI (AUTHENTICATION/IFF)			
MISSION EQUIPMENT CHECK			
AS DICTATED BY MISSION:			
1. A/C LIMITATIONS (RANGE, POWER, ETC.)			
2. ARMAMENT			
3. MISSION-SPECIFIC EQUIPMENT (SLINGS, ETC.)			
4. NVGs AND OTHER PERSONAL MISSION-ESSENTIAL EQUIPMENT			
MISSION PLANNING*			
1. MISSION REQUIREMENTS DETERMINED			
2. ENEMY SITUATION CONSIDERED			
3. FRIENDLY SITUATION CONSIDERED			
4. WEATHER/LIGHTING ASSESSED			
5. SUPPORT CAPABILITIES ASSESSED			
6. MAP RECON			
7. PLAN TACTICALLY SOUND			

*THESE ITEMS WILL REQUIRE QUESTIONING.

Side 1

	NA	YES	NO
EMERGENCY/CONTINGENCY PREPARATION			
PREPARATION FOR:			
1. AIRCRAFT INFLIGHT EMERGENCIES			
2. ENEMY SIGHTINGS			
3. FARP (NOT THERE, UNUSABLE)			
4. INADVERTENT IFR			
5. ESCAPE AND EVASION			
6. CHANGE OF MISSION			
7. LOST COMMO AND/OR ECCM			
CREW BRIEFING			
1. MISSION REQUIREMENTS DESCRIBED			
2. ENEMY SITUATION DESCRIBED (LOCATION, STRENGTH, TYPE)			
3. FRIENDLY SITUATION DESCRIBED (LOCATION, TYPE)			
4. FLIGHT PLAN DESCRIBED			
5. LOST COMMUNICATION PROCEDURES BRIEFED			
6. COMMAND STRUCTURE DESCRIBED			
7. CREW DUTIES ASSIGNED			
A. PREFLIGHT			
B. FLIGHT			
C. EMERGENCY/CONTINGENCY			
8. SUPPORT DESCRIBED			
A. POL			
B. ARMAMENT			
C. RATIONS			
D. MAINTENANCE/RECOVERY			
E. MEDEVAC			
MISC. MISSION FACTORS	NF→		
1. AVOIDED ENEMY DETECTION/ENGAGEMENT*			
2. CHANGE IN MISSION			
A. FLEXIBLE TO CHANGE			
B. FOLLOWED ACCEPTED PROCEDURES			
3. MISSION COMPLETED WITHIN ALLOTTED TIME			

*IF NOT AVOIDED, STATE CAUSE OF DETECTION/ENGAGEMENT (FOR EXAMPLE, RADIO TRANSMISSION, OVERFLYING ENEMY, FLYING TOO HIGH).

ATM STANDARDS FOR MISSION PLANNING MET

CANYON RESEARCH GROUP, INC
ARI FIELD UNIT FT RUCKER

Side 2

APPENDIX D

INTRODUCTORY QUESTIONNAIRE

You are participating in the field test of a training module for tactical premission planning that has been developed for unit training. To accomplish this, we will need feedback from you as aviators and trainers during the field testing of the module. At this time, we want information about your background and some of your perceptions and opinions.

We are extremely dependent upon your cooperation and frankness. Throughout the field testing, it is important for your responses to be candid and objective--we are seeking information, not compliments. Your assistance is greatly appreciated.

This information will be used only for research purposes. It will not be reported to your commander. Your name will not be used in any reports of this research.

Canyon Research Group, Inc
ARI Field Unit, Fort Rucker

INTRODUCTORY QUESTIONNAIRE

1. The last four digits of your SSN __ __ __ __

2. Your rank: _____

3. Date rated as Army aviator: Month_____ Year ____

4. Primary aircraft you are flying now: _____

5. Your approximate total flying hours (nearest hundred hours): _____

6. Your approximate flying hours by aircraft:

Aircraft	Hours
AH-1	
OH-58	
OH-6	
UH-1	
Other below	

7. Your approximate RW flying hours during:

   The last 3 months _____

   The last 6 months _____

   The last 12 months _____

8. Did you have flight experience in Vietnam? Yes ____ No____

9. Have you had night terrain flight experience? Yes ____ No____

10. If yes to Question 9, how many hours with and without night vision goggles (NVG)?

W/NVG (check one)		WO/NVG (check one)	
Less than 20 hours	_____	Less than 20 hours	_____
20 hours or more	_____	20 hours or more	_____

11. Have you previously used modular training? (Check one.)

Yes _____

No _____

Not sure _____

Don't know what modular training is _____

12. Rate the difficulty of planning for the missions listed on the left (check one box for each mission).

	DIFFICULTY				
MISSION	Extremely Difficult	Difficult	Average	Easy	Very Easy
Advanced Guard					
Rapid Reaction Forces					
Area Recon					
Route Recon					
Zone Recon					
Screening Operation					

13. Rate the difficulty of executing each of the missions.

	DIFFICULTY				
MISSION	Extremely Difficult	Difficult	Average	Easy	Very Easy
Advanced Guard					
Rapid Reaction Forces					
Area Recon					
Route Recon					
Zone Recon					
Screening Operation					

14. Rate the need for a training module in each of these areas.

AREAS	RELATIVE NEED: Very Urgently Needed	Urgently Needed	Needed	Not Needed	Definitely Not Needed
Advanced Guard					
EW					
NBC					
Night Terrain Flight					
Premission Planning					
Rapid Reaction Force					
Area Recon					
Route Recon					
Zone Recon					
Screening Operation					

15. How would you describe your unit's premission planning? (Check one.)

Very Organized _____

Organized _____

Unorganized _____

Very Unorganized _____

16. How would you describe your unit's premission planning performance? (Check one.)

Very Effective _____

Effective _____

Ineffective _____

Very Ineffective _____

17. Given well defined performance standards, aviators can accurately evaluate their own performance. (Check one.)

Strongly Agree _____

Agree _____

Neutral _____

Disagree _____

Strongly Disagree _____

18. How often in your unit does inadequate premission planning result in mission failure? (Check one.)

Very Frequently _____

Frequently _____

Infrequently _____

Very Infrequently _____

Don't Know _____

APPENDIX E

WEEKLY QUESTIONNAIRE

The attached questionnaire is designed to obtain your responses to questions regarding your experience with the premission planning module during the past week. The information you provide will be used only for research purposes. It will not be reported to your commander, and your name will not be used in any reports of this research.

Your continued assistance in this field testing is greatly appreciated.

Canyon Research Group, Inc.
ARI Field Unit, Fort Rucker

WEEKLY QUESTIONNAIRE

ALL QUESTIONS REFER TO EVENTS OCCURRING DURING THE PAST WEEK

1. Today's Date_____ 2. Last Four Digits of SSN_ _ _ _ 3. Primary A/C_____

4. Indicate approximate average planning time for those missions you flew (in minutes):

Advanced Guard	_____	Area Recon	_____	Target Acquisition, Handoff, Attack	_____
Rapid Reaction Force	_____	Route Recon	_____		
				Other (specify)	
Screening Operation	_____	Zone Recon	_____	_____	_____

5. Indicate which, if any, documents you have checked into regarding mission planning during the past week. (Check appropriate answer.) (Circle any item you do not understand.)

Documents	During Mission Planning Phase	At Any Other Time	Documents	During Mission Planning Phase	At Any Other Time
Aerial Photos			MIJI Report		
ATM			Operations Map		
CEOI			OPORD		
-10			Overlays		
FM's*			Spot Reports		
FRAGORD			Other TC's*		
Hazards Map			Other TM's*		
INTSUM			Unit SOP		
Maps: 1:25,000			Other (specify)		
1:50,000					
1:250,000					
VFR Sectional					

*If used, which ones? _____

6. Indicate which, if any, individuals you talked with about mission planning during the past week. (Check appropriate answer.) (Circle any item you do not understand.)

Individuals	During Mission Planning Phase	At Any Other Time
Air Mission Commander		
Crew Members		
Intelligence Officer		
IP		
Operations Officer		
Other Pilots		
Platoon Leader		
Supported Unit**		
Supporting Unit**		
Unit Commander		
Weather Officer		
Other (specify)		

**Position of person contacted?_____

7. How many missions did you plan last week? _____

8. How many missions did you fly last week? _____

9. Fill in the number of times you used the following materials for mission planning or for flight mission planning:

Material	Flight Mission Planning	Mission Planning Training
a. Checklist	_____	_____
b. Training Guide		
(1) Section I. Acquire Premission Information	_____	_____
(2) Section II. Conduct Mission Planning	_____	_____
(3) Section III. Conduct Contingency Planning	_____	_____
(4) Section IV. Conduct Crew Briefing or Premission Checks	_____	_____
c. Checksheet	_____	_____

10. How useful were the materials you used? (Check one box for each item of material.)

Material	Very Useful	Useful	Not Useful	Not Used
a. Checklist				
b. Training Guide				
(1) Section I. Acquire Premission Information				
(2) Section II. Conduct Mission Planning				
(3) Section III. Conduct Contingency Planning				
(4) Section IV. Conduct Crew Briefing or Premission Checks				
c. Checksheet				

11. If you used the checklist, in what way did you use it? (Check appropriate answer(s).)

Planning every tactical mission _____

Planning some tactical missions _____

Occasional memory aid in planning _____

Briefing on mission _____

Inflight mission change _____

Premission planning training (mission not flown) _____

Other (specify)_____

_____

12. If you used the Training Guide, in what way did you use it? (Check appropriate answer(s).)

Scanned the entire Guide _____

Scanned one or more sections _____
Which one(s)?_____

_____

Read the entire Guide carefully _____

Read one or more sections carefully_____
Which one(s)?_____

_____

Reviewed items of specific interest_____
Which one(s)?_____

_____

Other (specify)_____

_____

13. If you used the Checksheet in what way did you use it? (Check appropriate answer(s).)

	Mission Flown	Mission Not Flown
Assessed my premission planning		
Assessed another pilot's premission planning		
Had my premission planning assessed by another pilot		

14. Did you have any problems in using the Module? If so, explain.

15. Do you have any suggestions for improving the Module? (Content, more explanation, example, etc.)

PLEASE CHECK TO MAKE SURE ALL QUESTIONS HAVE BEEN ANSWERED. TURN THIS QUESTIONNAIRE IN TO THE DESIGNATED OFFICER FOR MAILING. THANK YOU FOR YOUR ASSISTANCE.

APPENDIX F

TACTICAL PREMISSION PLANNING TRAINING MODULE

QUESTIONNAIRE

The information you provide will be used only for research purposes. It will not be reported to anyone outside the research community, and your name will not be used in any reports of this research.

Date: _____

Fort: _____

Unit: _____

PERSONAL DATA

Rank: _____ SSN (Last Four Digits): _____

Time flown in last 90 days _____

Have you had rotary wing combat experience? Yes ___ No ___

Have you ever been an IP? Yes ___ No ___. If yes, about how many hours? _____

Are you currently an IP? Yes ___ No ___.

INSTRUCTIONS

This questionnaire contains statements rather than questions. Your response to each statement is recorded by checking the space underneath the words most closely corresponding to how you feel about the statement. We realize that, in many cases, a checkmark may not represent a complete response, and that you may wish to explain or further clarify your response. A space is provided after each question for that purpose. We encourage your comments, because they will make our data more meaningful.

1. Use of the Tactical Premission Planning Training Module was helpful to me personally as a means of improving my own premission planning performance.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

2. The Tactical Premission Planning Training Module was practical (easy to use) in a unit training environment.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

3. The Tactical Premission Planning Training Module is compatible with the day-to-day operations of my unit.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

4. The Tactical Premission Planning Training Module was difficult to use because of special mission requirements in my unit.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

5. My unit has special geographical considerations, e.g., terrain or climate, which make it difficult to use the Tactical Premission Planning Training Module.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

6. The Tactical Premission Planning Training Module appears to be adaptable to any geographical location.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

7. The oral orientation given by Canyon Research which introduced me to the Tactical Premission Planning Training Module was clear and complete.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

8. The materials contained in the Tactical Premission Planning Training Module were clear.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

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9. The materials contained in the Tactical Premission Planning Training Module were complete for my needs.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

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_____

Questions 10 thru 15 deal with common Air Cavalry missions. Your response is based on your knowledge of what each type mission entails. You need not have actually planned the specific type mission using the Tactical Premission Planning Training Module to make a judgment.

10. The Tactical Premission Planning Training Module would be useful for planning area recon missions.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

11. The Tactical Premission Planning Training Module would be useful for planning route recon missions.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

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_____

12. The Tactical Premission Planning Training Module would be useful in planning zone recon missions.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

13. The Tactical Premission Planning Training Module would be useful for planning advanced guard missions.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

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_____

14. The Tactical Premission Planning Training Module would be useful in planning screening missions.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

15. The Tactical Premission Planning Training Module would be useful in planning rapid reaction force missions.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

16. The Tactical Premission Planning Training Module would be useful in planning any VFR mission.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

17. The GUIDELINES FOR USE provided adequate instructions about how the module is to be used.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

18. The Premission Planning CHECKLIST was useful as an aid during the premission planning process.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

19. The TRAINING GUIDE for Tactical Premission Planning was useful as a self-teaching device.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

20. The Premission Planning CHECKSHEET was useful as a means to check the effectiveness of my own premission planning.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

21. I fell that self-assessment, the technique using the checksheet, is an excellent means of improving my performance in premission planning.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

Only those aviators who have graduated from flight school within the last 12 months should answer questions 22 and 23. Others go on to #24.

22. The instruction I received in flight school on tactical premission planning was adequate.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

23. Based on my experience with the Tactical Premission Planning Training Module I would recommend it be incorporated into the curriculum for flight school students.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

24. The Tactical Premission Planning Training Module would be useful to me as long as I am in a flying job.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

25. I would like to have a copy of the Tactical Premission Planning Training Module for my personal professional library.

Strongly Disagree	Moderately Disagree	Somewhat Disagree	Somewhat Agree	Moderately Agree	Strongly Agree
( )	( )	( )	( )	( )	( )

Comment: _____

_____

_____

_____

_____

26. The CHECKLIST issued with the Tactical Premission Planning Training Module was presented in two formats (vertical and horizontal). Please circle the format you prefer. Vertical Horizontal

Comment: _____

_____

_____

_____

_____

27. Any additional comments? _____

PLEASE CHECK TO MAKE SURE ALL QUESTIONS HAVE BEEN ANSWERED. THANK YOU FOR YOUR ASSISTANCE.

APPENDIX G

GLOSSARY OF TERMS

FUNCTION	A series of tasks performed by one or more individuals in preparation for (e.g., premission planning), in support of (e.g., artillery fire), or in the execution of (e.g., NOE flight), a mission (e.g., zone reconnaissance).
INSTRUCTIONAL SYSTEM	The total effort, distinct from the operating system by location, authority, or mission, that is concerned with the preparation of individuals to serve the operating system.
JOB PERFORMANCE AID	A checklist, instruction sheet, or other device which guides the individual's performance to enable him to do something which he was not previously able to do, without requiring him to undergo complete training.
MISSION	A military action required of an aircrew by written or verbal orders from a higher authority to achieve a specific purpose. It is characterized by a specific beginning and ending point and divisibility into two or more mission segments.
MISSION SEGMENT	A part of a mission having an identifiable beginning and end.
NAP-OF-THE-EARTH FLIGHT	Flight at varying airspeeds as close to the earth's surface as vegetation, obstacles, and ambient light will permit, while generally following the contours of the earth.
PERFORMANCE DEFICIENCY	A level of performance, at the individual or group level, which is considered to be inadequate when compared to some specified performance standard.
PREMISSION PLANNING	The group of tasks which should be performed from the time the aviator receives the mission order up to and including the time of aircraft runup.
TASK	The lowest level of behavior in a job that describes the performance of a meaningful function in the job under consideration.
TASK LIST	A list that itemizes all the tasks that make up a selected duty; also known as a task inventory.
TERRAIN FLIGHT	The tactic of employing aircraft in such a manner as to use the terrain, vegetation, and man-made objects to enhance survivability by degrading the enemy's ability to detect the aircraft by visual, optical, or electronic means. Includes the modes of 1) Nap-of-the-Earth (NOE); 2) Contour, and 3) Low Level Flight.
TRAINING MODULE	A self-contained or self-instructional unit of instruction that has an integrated theme, provides students with information needed to acquire specified knowledge and skills, and serves as one component of a total curriculum.

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